



## **COVER PAGE**

### **CREATIVE STYLE: THE MEASUREMENT, CHANGEABILITY AND RELATIONSHIPS WITH LEADERSHIP AND PERFORMANCE**

L. M. Rabbetts

A thesis submitted in partial fulfilment of the requirements  
for the degree of Doctor of Philosophy

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The University of Sheffield  
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## **Abstract**

The majority of existing creativity research focuses on measuring the level to which people are creative, or the amount of creative output achieved; in contrast, research into creative style refers instead to the tendencies of an individual in terms of how they personally achieve and/or contribute to creativity. Creative style is currently an under-researched area which often lacks theoretical links to the wider field of creativity and innovation, resulting in a fragmented and isolated body of research.

This thesis presents two research studies which aim to: align creative style to an established model of creativity and innovation (the Dynamic Componential Theory; Amabile & Pratt, 2016); and to better understand the nature of creative style and its relationships with other constructs through a new measurement tool.

Study 1 involved 303 participants across two timepoints, six months apart. This study established the reliability and factor structure of the Creative ID measure of creative style, whilst demonstrating that creative style (at time 1) can account for additional variance in creative/innovative performance (at time 2) after controlling for Big Five Personality Domains. Additionally, creative styles were seen to be generally stable over time, yet can develop following the experience of specific work-life events such as being promoted to a leadership position.

Study 2 involved multilevel data from 178 participants (125 followers nested within 48 leaders). This study found no significant relationships between the creative style and leadership style of an individual, implying that ways of being creative and ways of leading are not related. Some significant relationships were found between the creative style of a leader and their followers' creative/innovative performance; as well as between leadership style and follower creative/innovative performance.

Theoretical contributions and practical implications of this work are discussed, along with recognised limitations and suggestions for future research.

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## Chapter 1: Introduction

In setting the scene and introducing this thesis, it should be made clear from the outset how the research opportunity originated, the roles and relationships involved in this research, and how this context has informed certain research decisions. The funding for this research was provided by Creative Creatures, a consultancy specialising in corporate creativity and innovation training – Creative Creatures have had an ongoing relationship with the University of Sheffield, and in particular Professor Kamal Birdi, since 2009. This relationship has primarily focused on the design, development and validation of their psychometric tool which measures creative style preferences of participants – this tool is known as Creative ID™ and will be discussed in greater detail throughout the thesis. Creative Creatures has worked both directly with Prof Birdi on the development of the tool, as well as funding research projects which were completed by MSc Occupational Psychology students as part of their Masters degree course – one such student who completed a project funded by Creative Creatures was Lee Rabbetts, the researcher responsible for the current research and author of this thesis. As part of the current research, Creative Creatures had two key objectives which they wished to achieve – firstly, to evaluate the current version of the Creative ID™ tool (referred to as version 4 throughout the thesis) in its current format, enabling the utilisation of an existing dataset of over 3,000 participants. This objective therefore informed some of the research and methodological decisions to not only use the Creative ID™ tool rather than any of the available alternatives, but also to use the tool in its current format without changes. Secondly, the sponsoring organisation wanted to strengthen the links between the Creative ID™ tool and the relevant creativity and innovation literature, identifying the best fit in terms of a ‘home’ for the tool within the existing field of research. This aim required the thesis and associated research to take both a broad investigation of the nature of creative style and the wider creativity/innovation literature, whilst also being narrowly focused upon the evaluation of the Creative ID™ tool.

In terms of that broader investigation of the literature, it can be seen that creativity and innovation are prevalent and well-researched areas of the occupational psychology field. The development of creativity research over time has been phenomenal – it is estimated that approximately 9,000 works on the topic of creativity were published in a 32 year period between 1960 and 1991 inclusive (Feist & Runco, 1993). This figure may be a slight underestimate when considering a Web of Science search between these dates for ‘creativity’ as the topic or abstract returns 10,750 results. However, in the most recent 32 year period (1992-2023 inclusive) the same search term in Web of Science returns 113,728 results, more than ten times the number of articles, books, dissertations, etc. produced in the same amount of time. In fact, it is estimated that (beyond the academic confines of Web of Science)

there were one million articles and books created on the topic of creativity between 2000 and 2018 (Kingston University London, 2018). The benefits of both creativity and innovation to organisations and individuals has been well documented in the academic literature, including at the organisational level; increased performance, success and longer-term survival (Anderson et al., 2014). Whilst at the individual level, creativity is seen as more important than ever due to its role in problem-solving, remaining cognitively flexible and therefore being able to adapt to the changing world and working environment we find ourselves in (e.g. Runco, 2004; Vincent-Lancrin et al., 2019; World Economic Forum, 2023). Furthermore, the promotion of creativity in industry beyond an academic audience has also become more prominent in recent times (Vincent-Lancrin et al., 2019; World Economic Forum, 2023) – all of which emphasise the current and growing importance of this area, both in terms of theoretical contribution and practical application.

As would be expected in such a deep area of research, a number of established models with a wealth of empirical findings supporting them have been proposed to understand the role of creativity and innovation in organisations, as well as the antecedents to maximising creative/innovative performance (e.g. Amabile, 1983; Amabile & Pratt, 2016; Woodman et al., 1993; Drazin et al., 1999; Ford, 1996; Kaufman & Beghetto, 2009; Villanova & Cunha, 2021). These models, which will be discussed in greater detail throughout this thesis, feature individual, team and organisational level factors – yet one area of creativity has been absent from such models – the construct of creative style. Creative style refers to the way in which an individual prefers to be creative and the associated patterns in their thinking and behaviour (e.g. Kirton, 1976, 1987, 1999; Wechsler et al. 2012). For example, in the pursuit of creativity, some people may start from scratch, to come up with many of their own original ideas and solutions to problems with minimal input or stimulus required from others. In contrast, others may adapt existing concepts, building upon existing ideas or narrowing down potential solutions. There are a number of identified different creative styles, and a range of methods for measuring these – each of these are discussed in greater detail throughout this thesis. Creative style is not a common or particularly well-integrated area in the field of occupational psychology based on the findings of the literature review in this thesis (Villanova & Cunha, 2021; Williams et al., 2016; Zhang et al., 2015). Previous research into creative style has resulted in a number of tools for measuring creative style and a number of identified correlations with other existing constructs such as certain personality traits – however, the existing measures of creative style typically distance themselves from more general theories and models of creativity and innovation, resulting in an isolated island of research which has no theoretical or empirical links to creative behaviour/output – the very thing which an individual is trying to achieve through their creative style. The reasoning for

distancing creative style from creative and innovative performance (as stated by the existing measures of creative style - such as Kirton, 1976, 1987, 1999) is that the creative style of an individual, i.e. the preference an individual has in their method for pursuing creativity, does not necessarily correlate with, or predict, levels of creative performance.

At the level of definitions, this is undoubtedly a valid argument – your creative style is an indication of your preferred way of completing creative tasks, not a measure of how good you are at these tasks. Though this logic holds, three things must be considered at a more practical level – firstly, if a measure of creative style does not predict creative performance (or any recognised outcome measure), how is such a tool validated? How do we know that it measures what it sets out to measure? Secondly, if creative style does not predict or correlate with any measure of performance, what is the benefit in learning more about it? Does it add anything practical beyond existing measures of personality or behaviour styles? Finally, if creative style is not grounded in any established theory – which is the current situation based on the extant literature – again, how can measures of this construct be determined to be valid? How do we know what creative style is tapping in to as a measure, and how the knowledge of it can be reliably used to gain some kind of benefit for individuals and/or organisations? There is currently a lack of connection between the specific literature on creative style and the wider literature on creativity and innovation, despite the former being explicitly concerned with the pursuit of the latter.

In the same way, despite creativity theories including areas such as ‘creativity relevant processes’ (e.g. the Dynamic Componential Theory; Amabile & Pratt, 2016) which are concerned with the traits, behaviours and styles of working in the pursuit of creative and innovative outcomes – none of the theories explicitly refer to, or include, the construct of creative style. Again, this is understandable bearing in mind the construct has been defined in such a way that purposely distinguishes it from creative or innovative performance. However, it is the position of this thesis that the relationship between creative style and creative/innovative performance should be explored in greater depth, and that current definitional differences are standing in the way of an island of niche research in creative style from contributing value to established theories in the wider field of creativity and innovation.

This is the basis of the theoretical contribution this thesis aims to make – by broadening the definition of creative style to align to the wider field of creativity and innovation, exploring the nature of creative style in terms of its changeability over time; its relationship with other theoretically-related constructs and creative/innovative performance; and its proposed position for inclusion within established

creativity theory. This relative lack of research and understanding into the construct of creative style has provided this thesis and research with scope for great freedom and exploration in discovering the nature of this relatively niche area; whilst also being restrictive in the need for rigour to better define a construct that lacks the extensive body of previous research afforded to other areas of occupational psychology, and in particular, creativity.

Chapter 2 of this thesis comprises a literature review which focuses on four key areas of the existing literature. Firstly, the existing literature on creativity and innovation is explored – it is clarified why this is an area of research that is worthwhile for such great attention, before analysing the existing dominant models of creativity and innovation to determine the logical ‘home’ for creative style as part of the Dynamic Componential Theory of creativity and innovation (Amabile & Pratt, 2016). Secondly, the existing research in creative style is reviewed to establish a working definition, as well as distinguishing creative style from other constructs such as creative personality, before discussing and critiquing existing measures of creative style and introducing Creative ID – the tool of choice for which to base the current research. Thirdly, the literature review goes into more depth around the changeable nature of creative style over time, drawing on the literature relating to personality traits to explore how, and why, certain constructs have been found to change over time following the experience of certain work-life events. Finally, this chapter takes a closer look at the leadership literature, specifically around leadership styles – including transformational leadership – the relationship with creative/innovative performance, the potential mechanisms by which leadership styles have had an impact on creative/innovative performance in previous research, and how this could relate to creative style. The decision to include leadership and leadership style in the current research was made for two reasons; firstly, leaders are an interesting population in that they have different expectations placed on them in terms of creativity and innovation compared to the general working population – given their level of seniority they generally have a greater requirement for strategy and strategic thinking which involves creativity (Mintzberg, 1994; Dixit et al., 2021; Ershadi and Dehdazzi, 2019) as well as having to consider their influence over team members in the pursuit of their respective performance and creative goals. Secondly, to better understand the construct of creative style by looking not just at the relationship between an individual’s creative style and their own performance, but to look broader into the relationship between an individual’s creative style and the performance of those which they have a certain level of influence over – in a working context, the most logical workplace relationship to explore in this area is that of leader-follower.



As a result of the literature review, three research questions were formulated which were addressed through two distinct studies:

1. How robust is the Creative ID measure of creative style, and to what extent can creative style explain variance in performance at different stages of the creativity/innovation process?
2. Is an individual's creative style more state-like or more trait-like in its changeability over time and which factors contribute to observed changes?
3. Does an individual's creative style relate to their leadership style, and how do these styles at the leader level relate to follower creative/innovative performance?

Chapter 3 outlines the research methodology of the studies presented in the thesis – outlining the reasoning for the ontological and phenomenological stances taken.

Chapter 4 covers Study 1 – involving online surveys of 303 participants across two timepoints, six months apart, this study looked to establish: the factor structure of the Creative ID tool, correlations with Big Five Personality Domains and determining whether creative style (at time 1) could account for a significant amount of variance in creative/innovative performance (at time 2) after controlling for Big Five Personality Domains. Additionally, it was explored whether creative style changes over time, and if so, whether such a change could be attributed to the experience of specific work-life events. In presenting Study 1, this chapter firstly covers the development of the research hypotheses, before explaining the specific methodology and measures used, before presenting the results and discussing the key theoretical and practical implications.

Chapter 5 covers Study 2 – This study involved multilevel data from online surveys of 178 participants (125 followers nested within 48 leaders). This study explored the relationships between a leader's creative style, their transformational leadership style behaviours, and follower creative/innovative performance. The possibility of transformational leadership mediating the relationship between a leader's creative style and follower creative/innovative performance was explored. This chapter also presents some additional analyses of interest which looked to replicate the findings from Study 1 in terms of the observed relationships between an individual's creative style and their creative/innovative performance, as well as some exploratory analyses relating to the potential moderating role of a leader's creative style on the relationship between follower creative style and follower creative/innovative performance.

Chapter 6 is a discussion chapter which builds upon the discussion points raised in Chapters 4 and 5 regarding the theoretical contributions made, the practical implications of the observed findings, acknowledgements of the recognised limitations of the research and finally, suggested areas for future research in this area.

Finally, Chapter 7 is a short conclusion chapter which mirrors the structure of this, Chapter 1 Introduction, by summarising the key points, learnings and theoretical contributions that each area of the thesis has made.

## Chapter 2: Literature Review

The purpose of this chapter is to detail a literature review which is relevant to the current research focusing primarily on the construct of creative style. As will be covered in greater depth throughout the following sections, creative style is a relatively under-researched construct, and as such, this literature review is required to take a slightly unconventional structure in order to provide insight into the background to this construct, from which research can be conducted and contributions to theory and knowledge developed. Many theses in this field would follow a relatively linear, chronological structure – whereby the literature review takes into account established theory and previous research, identifying gaps for future research. Those identified gaps are addressed in the present research, which then inevitably identifies new areas for research, which will in turn be tackled by future studies/theses. This literature review is structured slightly differently – as will become clear throughout this chapter, there is little research and theory into creative style to ‘look back’ upon, yet there are measures of creative style which have endured for over 50 years. In this case it is not always possible to look back over established theory and empirical evidence to spot gaps for knowledge and theory development – in the fragmented and messy history of research into creative style, the theory simply is not explicitly established, yet the measures of creative style are enduring and in some cases are unclear as to exactly what they measure, or the theory that they are grounded in. Therefore, this literature review involves not just looking back over previous research and theory directly related to creative style, but also taking a more holistic approach to review existing theories which do not account for creative style, and measures of creative style which do not align to theory, and attempting to reconcile the two in such a way that forms a basis for the development of meaningful research questions, testable hypotheses and practical research studies.

In an effort to untangle and reconcile the literature on this topic, the following chapter is structured in four main sections:

**Section 2.1.** Creativity and innovation – this first section takes a more general look at the broad area of creativity and innovation. Due to creative style’s lack of theoretical grounding, it is important to explore where it best ‘fits’ in the wider literature. This section explores the importance of creativity and innovation in terms of the benefits that these outcomes bring to individuals, teams and organisations. Dominant theories, processes and definitions in relation to creativity and innovation will be discussed, with the aim of establishing a solid understanding and a reasonable base from which to identify where the construct of creative style fits among the literature, and where the inclusion of creative style in established theory could bring about a meaningful contribution.

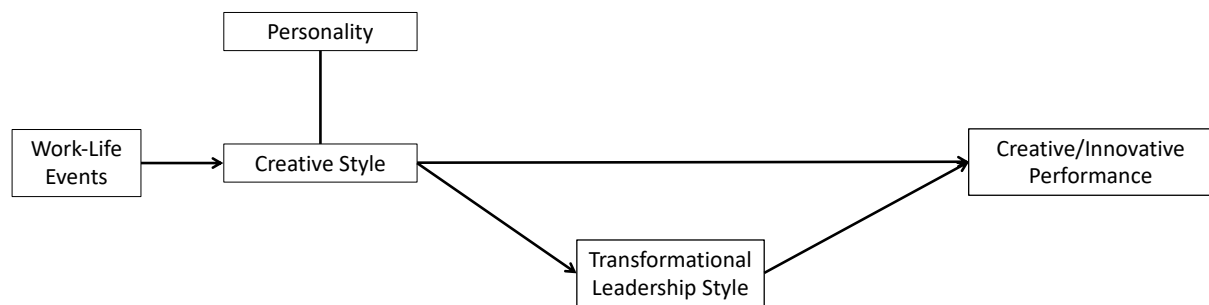
**Section 2.2.** Creative style – this section goes into more detail around what creative style is, what it is not, and how it is measured. This section will assess the current measures of creative style, as well as critiquing these measures in relation to the measure to be used in the current research, the Creative ID. This section will start to build the higher-level theoretical links between the construct of creative style and creativity/innovation; as well as to consider how this construct may relate to others such as personality. Finally, the lower-level measurement issues of creative style will be explored, detailing how different styles are currently measured, and identifying where developments can be made in this area.

**Section 2.3.** States, traits and changeability of creative style – this section explores the nature of creative style over time, in particular whether an individual's style changes, and what could contribute to such a change. The purpose of this research thread is to address a lack of knowledge in the existing literature; whereby it is unclear whether creative style is more trait-like and relatively unchangeable, or whether it is more changeable depending on context or the experience of specific work-life events.

**Section 2.4.** Leadership – finally, this section brings in another area to explore in conjunction with creative style. Firstly, the importance of 'good' leadership will be highlighted in terms of the benefits for individuals, teams and organisations; before moving on to clarify how 'good' leadership can be categorised into desirable leadership styles. Secondly, when considering the more 'desirable' leadership styles (such as transformational leadership), these have been found to predict greater creative/innovative performance, and yet little is understood in terms of how these leadership styles themselves are predicted. Theoretical links between creative style and leadership style will be explored, as well as the potential for leadership style to be related to both leader creative style and follower creative/innovative performance.

Following these sections, the three core research questions for the thesis will be formulated. Each research question will be explained in terms of the logic and previous research which have contributed to its construction, how it will contribute to testable research hypotheses, and the purpose for conducting such research in terms of how the outcomes aim to contribute to theory and address gaps in our current knowledge. Finally, a summary section will be provided to reiterate the findings of the literature review and how this review has contributed to the creation of a conceptual framework (as shown in Figure 2.1) within which to test various relationships regarding creative style across two studies.

Figure 2.1 – Proposed conceptual framework for the research



## 2.1. Creativity and innovation

This thesis focuses predominantly on the construct of creative style – the way in which an individual prefers to be creative and the associated patterns in their thinking and behaviour. In order to ground the current research in the existing literature we must first explore the wider research on creativity and innovation as the most logical ‘home’ for creative style. This section provides an overview of creativity and innovation research by covering four main areas:

1. Defining creativity and innovation in an organisational context.
2. Providing an overview of the literature on workplace creativity and innovation.
3. Touching upon dominant and emerging theories of the creativity and innovation process.
4. Highlighting what are seen to be key antecedents of, or constructs impacting upon, the attainment of individual creativity and innovation.

### 2.1.1. Defining creativity and innovation

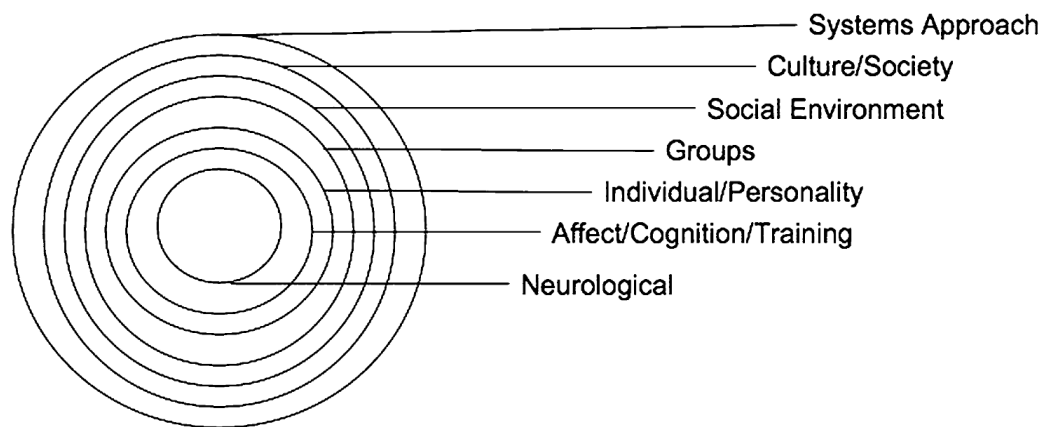
This section explores the existing definitions of creativity and innovation, highlighting the similarities and differences; specifically, in terms of differences across contexts and research disciplines, and similarities in their focus on output rather than process. The trend of diversification of definition will be discussed, as well as the implications of a fragmented research field, with an argument made for the adoption of a more general definition which will be adopted throughout this thesis and subsequent research.

Runco and Jaeger (2012) take a historical look at the definition of creativity and conclude that although both the world of work, and the creativity literature, have developed and progressed significantly, the ‘standard definition’ of creativity has not. They state that the ‘accepted definition’ is largely unchanged since the work of Stein (1953) and Barron (1955) who concluded that for something to be creative it must be both original and useful/valued in a relevant context. In contrast, Puryear and Lamb’s (2020) recent analysis states that there are still significant variations in the definition. They

propose that since Plucker et al. (2004) called for a more consistent definition of creativity, the fundamental elements of originality and usefulness/value have prevailed, yet there are noticeable remaining differences in definitions due to the need for relevant context. Examples of such differing definitions are outlined later in this chapter when discussing the theories of creativity and innovation (Section 2.1.3). These contextual differences exist between psychological, educational and business context disciplines, with these areas largely linking the definition of creativity to the outcome of psychometric outputs, problem-solving ability and idea generation tasks respectively (Puryear & Lamb, 2020). This notion of the definition of creativity being context-dependent is supported by Hennessey & Amabile (2010) who note that the field of creativity research has grown significantly, but also become more fractured in that “investigators in one subfield often seem unaware of advances in another” (2010, p. 569) resulting in each sub-specialism progressing not just their own research findings, but often their own definitions as well. This sentiment is echoed in Batey’s work on the measurement of creativity where he notes that due to the multitude of definitions and measurement methods in creativity research - “findings of different studies often prove difficult to draw into a coherent body of understanding.” (2012, p. 55).

Hennessey and Amabile go on to note that it is important to clarify not just your definition of creativity in your research, but also at which level your research sits, referencing their concentric circle schematic to illustrate the variety of levels upon which creativity forces operate (including, as illustrated in Figure 2.2, from the centre circle out; neurological, affect/cognition/training, individual/personality, group, social environment, culture/society, systems approach). The relevance of this to the current research is that, with there being no universally accepted definition of creativity, a working definition will be adopted which encompasses the standard recognised ‘core’ whilst being relevant to the context of occupational psychology and the level of the current research (predominantly the individual level, though applicable to groups).

Figure 2.2 – the major levels at which creativity forces operate – taken from Hennessey & Amabile (2010, p. 571)



A relevant addition to the creativity definition debate comes from Walia's (2019) paper where the author reviews existing definitions of creativity and suggests that a more dynamic definition should be used going forward which recognises the distinction between creativity (the act) and creation (the outcome). The significance here is that the vast majority of creativity research is concerned with creativity as a measure of output or performance, though Walia agrees with others that the existing definitions of creativity generally cover the core aspects mentioned above (generating something that is both novel and valuable/useful), they also argue that the act of creativity should not, and does not, necessarily result in the creation of something tangible such as a number of ideas generated or a recognisably novel and useful contribution. Walia argues that the lack of end 'creation' does not mean that creativity did not occur – there can be all the required elements for creativity, with adequate engagement in the process, but without the final result – this echoes the sentiments of Hughes et al. (2018) and links to the current research on creative style, which is a construct concerned with an individual's preferences and patterns of behaviour in pursuing creative outputs, rather than the specific attainment or maximisation of creative outcomes. Although there is no clear delineation between where creativity 'stops' and innovation 'starts' in the literature, there is a general consensus that "it is important to distinguish between creativity and innovation and to not use the two words synonymously" (Vehar, 2013, p. 385), with a simplistic view of the difference being that "creativity is getting the idea, and innovation is doing something about it" (Firestien, 1996, p. 16).

So, what exactly are the differences between creativity and innovation in terms of definition? A systematic review (Baregheh et al., 2009) found 60 different definitions of innovation and, as with the definition of creativity, found there to be a 'core' element focusing on the practical application of

something new. This core is present throughout the definitions utilised in popular innovation literature (Amabile & Pratt, 2016; West & Anderson, 1996). Again, there are inter-disciplinary differences across specialisms of; business and management, entrepreneurship, marketing, technology, and engineering, among others. To unify the definitions, Baregheh et al. condensed the variations:

*“Innovation is the multi-stage process whereby organizations transform ideas into new/improved products, service or processes, in order to advance, compete and differentiate themselves successfully in their marketplace.” (2009, p. 1334)*

This definition clarifies that innovation is the process by which ideas are implemented, however, there is a debate as to whether the formation of those initial ideas (i.e. creativity) forms part of the innovation process, or whether creativity is an independent process in itself which precedes innovation. The work of West and Farr (1990) and others suggests that innovation does not necessarily need to include the generation of ideas, only the implementation; however, others suggest that the areas of creativity and innovation contain a significant overlap making them extremely difficult to study in isolation (van Knippenberg, 2017), that they should be considered part of the same process impacting upon each other (Amabile & Pratt, 2016; Anderson et al., 2014), or that the innovation process is cyclical with creativity popping up at various points throughout (Paulus, 2002). Across the creativity literature, the greater or higher the performance level (i.e. in terms of ideas generated, novel ideas or originality and categorisation of ideas), the higher the level of creativity is deemed to be – and as is generally accepted, higher creativity is thought to be beneficial for individuals, organisations and wider society. However, it should be considered what the practical value is to an individual or organisation in an idea that goes nowhere? In those ideas that are generated yet do not get implemented or achieve their practical potential? Is increasing creativity as beneficial to individuals and organisations as we are led to believe without a tangible end product? This brings about the logical overlap between creativity (the generation of ideas) and innovation (the implementation of such ideas) research, or as Walia (2019) stated, the difference between creativity and creation – it could reasonably be argued that the genuine practical benefits of creativity for individuals, organisations and wider society are only possible through the process of innovation (or creation) to ensure the benefit of such novel and useful ideas are experienced in a tangible fashion (Firestien, 1996; Markides & Anderson, 2006) – “it [creativity] must exist in the broader external press of the marketplace that determines its success or failure” (Vehar, 2013, p. 388). Hughes et al.’s (2018)



critical review paper also assesses the varying definitions of creativity and innovation in the literature, concluding that creativity and innovation should be clearly delineated and integrated.

Based on the definitions reviewed and the accepted terminology of the field, the current research is expected to touch upon both the creativity and innovation literature, or as per the terminology put forward by Walia, both creativity and creation. When it comes to defining and measuring creative style (the definition and measurement of this construct will be covered in detail in Sections 2.2.1 and 2.2.4), existing definitions and measures are generally more closely aligned to the conceptual and divergent nature of creativity, rather than the more implementation focused innovation. However, it can be argued that this constitutes a limitation of existing research and methods and that there is a need for a broader definition and measurement to incorporate the wider innovation process – this will be addressed accordingly. Furthermore, in line with the phenomenological stance of this research, and the majority of creativity focused research in an occupational psychology context, the goal is to better understand the wider reality and obtain findings which are replicable and generalisable to a wide population. To achieve this level of generalisability, a working definition must be broad enough to be relatable to a large population, without being restrictive in its scope. This thesis and incorporated research propose that the construct of creative style is concerned with both the generation and implementation of ideas, as well as being relevant to any organisational context – therefore the chosen definition should be suitably broad enough to encompass both creativity and innovation, without the constriction of industry specific or demographic boundaries and restrictions.

Taking this into account, the integrative definition put forward by Anderson et al., encompassing both creativity and innovation is seen as appropriate for the current research:

*“Creativity and innovation at work are the process, outcomes, and products of attempts to develop and introduce new and improved ways of doing things. The creativity stage of this process refers to idea generation, and innovation refers to the subsequent stage of implementing ideas toward better procedures, practices, or products. Creativity and innovation can occur at the level of the individual, work team, organization, or at more than one of these levels combined but will invariably result in identifiable benefits at one or more of these levels of analysis.” (2014, p. 1298)*

Though Hughes et al., (2018) take this definition to a more precise level, whilst ensuring that the definition does not focus too heavily on the end result and acknowledges the ‘process’ and ‘attempt’ elements highlighted by Anderson et al., (2014).

*“Workplace creativity concerns the cognitive and behavioral processes applied when attempting to generate novel ideas. Workplace innovation concerns the processes applied when attempting*

*to implement new ideas. Specifically, innovation involves some combination of problem/opportunity identification, the introduction, adoption or modification of new ideas germane to organizational needs, the promotion of these ideas, and the practical implementation of these ideas.” (2018, p551)*

### **2.1.2. The importance of creativity and innovation**

This section reviews the existing creativity and innovation literature, with a specific focus on the benefits of creativity for individuals and organisations to establish why this is such a heavily populated and important area of research. The prevalent trend of research focusing on creative outcomes, rather than creative style as a predictor will be highlighted, with implications for the lack of research into the role of individual creative styles discussed.

Looking at reviews of the creativity literature tells us that the field is broad and becoming ever more fragmented. From Runco’s (2004) review which could be grouped broadly into four key areas of research covering biological, cognitive, developmental and organisational perspectives on creativity; through to Anderson et al.’s (2014) review ten years later which is able to cover nine areas of research solely within the parameters of individual factors which impact upon creativity in an organisational setting (many other areas are covered at the team level and multi-level). Similarly, the rapid expansion of the field can be highlighted by Runco who found that 9,000 works on creativity were published on creativity between 1960 and 1991 (Feist & Runco, 1993), yet since the year 2000, there have been an estimated one million articles and books published on the topic of creativity (Kingston University London, 2018). However, through a Web of Science search of publications associated with the term ‘creativity’ it can be seen that a number of these publications, as well as the associated theories and definitions, are concerned with a specific context such as; educational environments (Parkhurst, 1999; Plucker et al., 2004), those concerned with identifying the future potential of children (Runco & Acar, 2012; Torrance, 1966) or those specifically focusing on only the stereotypically ‘creative’ industries such as the arts (Balkin, 1990; Simonton, 2004). Though reputable in their own area of specialism, findings and theories from these areas will not be discussed in great detail in this thesis due to their lack of applicability in an organisational context.

This thesis, the literature review and research which form a part of it, focus on the creativity and innovation of individuals within organisations. This also incorporates literature using participant samples comprising adult students, whereby the findings are seen to be relevant to an organisational context – of course the inherent limitations of these particular studies and their generalisability to an

organisational context will be discussed if and when appropriate throughout. One further point of clarification to make is that this thesis does not focus specifically on creativity and innovation in teams – though research on teams is often inextricably linked to that of individuals (by the very nature that team are a collection of individuals, some level of overlap is inevitable) therefore, team-level research will be referenced throughout this thesis, again with a discussion point regarding how generalisable the findings and implications are to individuals as appropriate. The current research has made the decision not to focus on the team-level and the required intragroup dynamics and collective outputs that are intrinsic to that area of research. This decision has been made due to the relative lack of research into the specific area of creative style, whereby tackling the positioning of this relatively under-researched construct within the creativity and innovation of individuals is the logical first step in establishing and progressing the research in this area – moving on to team and group-level research would be a recommendation for future research, in a level of depth that unfortunately would be unachievable within the parameters of the current thesis.

Creativity and innovation are recognised to be highly beneficial for organisations in terms of performance, overall success, and their ability to survive in the longer-term (Anderson et al., 2014; Zhou & Hoever, 2014) as well as for the well-being of individuals (Acar et al., 2021). Florida states that creativity is the “most valuable economic resource” available to us (2012, p. 25) with Nonaka adding that “successful companies are those that constantly create new knowledge, disseminate it widely throughout the organization, and quickly embody it in new technologies and products” (1991, p. 162). Though it cannot be assumed that advancing technology is the route to all success, Nonaka clearly states that the route to technological advancement lies in the knowledge of individuals (and the successful management of this) – this sentiment is echoed by research such as van Laar et al.’s (2017) systematic literature review into research of 21<sup>st</sup> century skills and digital skills which found that “innovation starts with people” (2017, p. 577) and that creativity was identified as a core skill for the successful modern knowledge worker. This is supported by more recent publications from the OECD (Organisation for Economic Co-Operation and Development) by Vincent-Lancrin et al. (2019) which states that creativity is a key skill for complex, globalised and increasingly digitalised economies and societies; additionally, the World Economic Forum has identified creative thinking as a highly important skill for future jobs, second only to analytical thinking (World Economic Forum, 2023). Furthermore, the importance of creativity and innovation in organisations is highlighted by Runco’s (2004) review of the field which states that creativity has clear benefits for individuals, organisations and society as a whole. To this end, decades of research has focused on how to increase creativity, and how to better understand the individual traits and contextual factors which are seen to correlate

with, or predict, the occurrence of creativity and innovation. But what exactly are the individual and organisational benefits experienced as a direct result of creativity and innovation in organisations? Have these been quantified?

#### **2.1.2.1. Systematic Literature Review 1: Creativity and innovation in organisations – benefits and key models**

The section outlines the first of two systematic literature reviews conducted as part of this thesis – the aim of the first was to establish exactly what the current position of the literature is regarding the benefits that organisations can obtain through creativity and innovation. The specific research questions driving this literature search were:

1. *What are the benefits of organisational creativity?*
2. *What are the benefits of organisational innovation?*
3. *What are the key models of individual creativity?*
4. *What are the key models of individual innovation?*

The purpose for completing this systematic literature review was to determine the tangible practical value to individuals and organisations in researching creativity and innovation, beyond the understanding of theoretical models and psychological mechanisms which are seen to relate to creative and innovative outcomes. The literature review process and criteria were as detailed below.

Using Web of Science database, search ‘topic’ (which includes title, abstracts and keywords) using search term: ‘*creativity OR creative OR innovation OR innovative*’ AND ‘*organisational OR organizational OR work OR workplace OR business OR occupational OR psychology*’ – this aimed to identify relevant research in the fields of creativity and innovation within an organisational and/or psychological context and returned 360,999 results. These search results were refined by article type to include articles and review articles – this returned 269,000 results. The research area of ‘psychology’ was then used to refine the results further – this returned 49,405 results. Further refinements were made by both language (English) and publication date (1972-2022) – this publication range was chosen as, at the time of the literature review, this reflected the most recent 50 years of research; a significant period of time to review which should encompass all identified benefits which could still be deemed relevant to the modern world of work. These refinements on language and publication date returned 46,504 results.

Given that such large numbers of articles were still being returned, further refinements were added to the search. Firstly, by retaining all of the previous refinements, whilst adding an additional topic search term of '*benefit OR advantage OR impact OR outcome*' – this search term was chosen to further narrow the results down to those which not only discussed organisational creativity and innovation, but which specifically reference a benefit – this returned 17,327 search results. These results were then further refined by journal – those which are seen as most relevant to creativity and innovation literature (as confirmed by experienced academics in the field) as well as the more highly respected journals in the field of occupational psychology (as confirmed both by experienced academics in the field and influenced by SJR (SCImago Journal Rank) scores ensuring that they are in the top 2 quartiles of their research area). This list of journals for inclusion included: *Journal of Applied Psychology*, *Academy of Management Journal*, *Journal of Management*, *Journal of Occupational and Organisational Psychology*, *European Journal of Occupational and Organisational Psychology*, *Journal of Organisational Behaviour*, *Journal of Business and Psychology*, *Annual Review of Psychology*, *Personnel Psychology*, *Leadership Quarterly*, *Organisational Behaviour and Human Decision Processes*, *Creativity Research Journal* – following this refinement, the search returned 421 results, which was considered a manageable number to proceed with.

These 421 results were then manually screened to determine whether the abstract contained one or more of: a creativity and/or innovation model, an antecedent to creativity and/or innovation, a measure of creativity and/or innovation, or a review of creativity and/or innovation. This resulted in 227 relevant results, of which the abstracts were screened again to determine whether there was an explicit statement of what the benefits of creativity and innovation are/were to an organisation or individual; rather than explore the antecedents of creativity and innovation, and moderating and mediating constructs which impact upon the relationships between identified antecedents and creativity and innovation. In fact, just seven papers (3% of the 227 search results) stated a tangible, objective benefit to an organisation as a result of creativity and/or innovation – specifically, these benefits included; a higher number of published academic papers (Bornay-Barrachina & Herrero, 2018) and citations (Seibert et al., 2017), a higher number of patent applications (Jeong & Shin, 2019; Sung & Choi, 2014), a higher rating for organisations as judged by an industry standard (King et al., 2007), higher return on equity statistics in the banking sector (Richard et al., 2003) and higher sales results (Martinaityte & Sacramento, 2012). It seems that the majority of research starts from a universal basis that creativity is a good thing in organisations – and then sets out to explore how to maximise creative outcomes (such as idea generation), yet very few actually state (based on empirical evidence) what these benefits are. A notable, and typical, example is Williams et al.'s (2016) paper

which reviews the themes, impact and cohesion of creativity research over a 25 year period from 1990-2015 where it is simply stated that “The benefits of creativity are now widely recognized” (2016, p. 385) and “...obvious are the benefits of creativity for education, business, science, technology, the arts, and even health” (2016, p. 386) – yet there is no clarification or reference to exactly what these benefits are. This common omission is being addressed by researchers (Gong et al., 2013; Y. Zhang et al., 2021) who note that “scholars often state that employee creativity enhances firm performance. This statement, however, has not been directly examined” (Gong et al., 2013, p. 471); they go on to challenge the often accepted view that creativity improves organisation performance with their own empirical findings that creativity did not improve performance unless it was transformed and implemented to meet market demands i.e. going beyond the typical idea generation stage of creativity into the implementation stages of innovation (Gong et al., 2013). This study in particular highlights the importance of considering both creativity and innovation in the current research, and organisational research more broadly, should practical organisational outcomes be desired. It should also be noted that some research which was not highlighted by the systematic literature review does highlight clear, tangible benefits to organisations as a result of innovation. Kostopoulos et al. (2011) showed in their study of Greek businesses that innovation performance (e.g. introduction of new product or process innovations) was positively correlated with desirable sales and assets metrics; while other papers have found beneficial links between innovation and financial performance (Aas & Pedersen, 2011; Bigliardi, 2013; Gök & Peker, 2017). Manresa et al’s (2019) study of Spanish manufacturing firms found that the introduction of new products was related to increased revenues. Further support for this comes from Birdi (2021) who evidences tangible organisational benefits (including financial) following the implementation of successful innovation training. With the focus of this research and thesis being grounded in organisations, and looking to discover practical applications as a result of the findings, simply focusing on creativity alone may not have the desired generalisability to industry that the addition of innovation can offer. This refers back to, and justifies the relevance of, the chosen definition of creativity and innovation from Hughes et al. (2018) which proposes an integrated definition of creativity and innovation, where they can be treated as part of the same process, or considered independent as appropriate.

In concluding this section on the first systematic literature review, the research questions which guided the direction of this literature review can be revisited. Firstly, number 1, what are the benefits of organisational creativity? Based on the available research evidence, the literature review implies that organisational creativity in itself may not bring about direct tangible business benefits beyond increased performance in creativity-related tasks – however, organisational creativity does lead to

organisational innovation, which, in response to the second of the research questions behind this literature review (2 - *What are the benefits of organisational innovation?*) has been shown to lead to tangible business benefits in some cases. These are outlined above in terms of Innovation performance and financial performance.

This literature review lends support to the current research's position of including both creativity and innovation as key areas of interest, and therefore selecting a working definition which incorporates the two. Though creativity is undoubtedly beneficial within organisations in its own right for the impact it has on individuals and their subsequent innovation; it is the research on innovation which has demonstrated the tangible benefits at an organisational level. A theme of the research to be conducted and presented within this thesis is a 'bottom-up' approach which will be referenced throughout multiple chapters of this thesis – the research itself has not started with a solely theoretical position to be tested through empirical research; but originates in the corporate arena, seeing what organisations and individuals require, request and value, and subsequently relating this back to scientific theory for appropriate testing. It will be shown that this 'bottom-up' process of development is the nature of the creative style construct as well as a measure central to this research (outlined in 2.2.5) and that tangible outcomes valued by organisations remain at the heart of this research in that it aims to provide practical, actionable outcomes in addition to contributions to academic and scientific theory and knowledge. Therefore, innovation in addition to creativity form the key areas relevant to this research.

Much of the research into creativity and innovation treat these constructs as outcome measures – with individual differences being explored as predictors, mediators and moderators of creative/innovative outcomes. However, developments are now being seen at the individual level with the typical causational relationship being reversed – for example, instead of looking at the happiness and well-being as an antecedent of creative performance, empirical research has now shown that actively being creative is positively associated with increased well-being in individuals (C.-Y. Tan et al., 2021). The current research is well placed to continue this branch of research looking into how individual differences in creativity can impact upon beneficial outcome variables. As will be covered in greater detail (in 2.2.1) much of the existing literature distances creative style from other constructs, implying that considering creative style as a valuable predictor of other constructs such as creative/innovative performance (e.g. Kirton, 1976, 1987, 1999) or leadership style are either non-existent, or not worth further research as they simply do not fit theoretically – something which this thesis considers to be an oversight and potential gap in our existing knowledge.

The remaining two research questions (3 and 4) were concerned with the key theories of creativity and innovation in the literature. The following section will highlight the dominant theories of creativity and innovation in organisations, highlighting the point that there is very little inclusion of creative style in the theoretical literature, why this may be, and what we are missing by not including this construct in our thinking and theorising around the achievement of creativity and innovation. There is an opportunity to better explore a valuable and practical understanding of how individuals prefer to approach creativity, to define this in terms of differing styles, and to explore what these differing styles mean for tangible beneficial outcomes. Nevertheless, for research to be conducted in the field of creativity and innovation, a solid understanding of the existing literature should be achieved as a basis for identifying gaps to be filled and omissions to be addressed.

### 2.1.3. Creativity and innovation processes – current models and theories

Theories of creativity generally look to clarify what makes individuals creative and how to maximise the conditions which best promote creative outcomes. In popular theories including; Componential Theory and Dynamic Componential Theory (Amabile, 1983; Amabile & Pratt, 2016), Interactionist Perspective (Woodman et al., 1993), Model of Creative Action (C. M. Ford, 1996) and the Four Factor Theory of Team Climate for Innovation (West, 1990) - the measurement of creativity focuses largely on an output with metrics such as; number of ideas generated, novel ideas or originality and categorisation of ideas (Birdi, 2016). A brief overview of the dominant theories, along with the identified antecedents of increased creativity identified within each respective model is illustrated in Table 2.1. This table intends to illustrate the diverse approaches in thinking regarding the single ‘topic’ of creativity – with differing definitions of the constructs being measured and corresponding related constructs.

*Table 2.1 – Creativity models/theories*

Model/Theory	Creativity defined as	Identified antecedents to creativity within the model/theory
Componential Theory (Amabile, 1983; Amabile & Pratt, 2016)	<p>Creativity: “the production of novel and useful ideas by an individual or small group of individuals working together”</p> <p>Innovation: “the successful implementation of creative ideas within an organization” (Amabile &amp; Pratt, 2016, p. 158)</p>	<p>For individual or small group creativity: intrinsic motivation, synergistic extrinsic motivation, skills in the task domain, creativity-relevant processes.</p> <p>For organisational innovation: motivation to innovate, resources in the task domain, skills in innovation management</p>



		Additional identified antecedents: meaningful work, progress in meaningful work, work orientation, affect
Interactionist Perspective (Woodman et al., 1993)	"...creativity is the creation of a valuable, useful new product, service, idea, procedure, or process by individuals working together in a complex social system." (Woodman et al., 1993, p. 293)	Individual: Cognitive abilities, knowledge, personality, intrinsic motivation  Group: composition, characteristics, processes  Moderators and/or mediators: conditions, creative behaviour, social influences, contextual influences, organisation, environment
Sensemaking Perspective (Drazin et al., 1999)	Creativity: "We define creativity as a process, rather than an outcome... Creativity is a choice made by an individual to engage in producing novel ideas; the level of creative engagement can vary from person to person and from situation to situation." (Drazin et al., 1999, p. 290)	Individual: sensemaking  Interpersonal: shared frames of reference  Group: shared belief structures
Model of Creative Action (C. M. Ford, 1996)	Creativity: "...a domain-specific, subjective judgment of the novelty and value of an outcome of a particular action." (C. M. Ford, 1996, p. 1115)	Sensemaking  Motivation: Goals, beliefs, emotions  Knowledge and ability  Action
The Four C Model of Creativity (Kaufman & Beghetto, 2009)	Big-C: "clear-cut, eminent creative contributions" Pro-c: "an appropriate category for individuals who are professional creators, but have not reached eminent status" little-c: "those creative actions in which the nonexpert may participate each day" mini-c: "the novel and personally meaningful interpretation of experiences, actions, and events" (Kaufman & Beghetto, 2009, pp. 1–4)	N/A
Everyday Creativity (Villanova & Cunha, 2021)	Everyday creativity: a phenomenon in which a person habitually responds to daily tasks in an original and meaningful way... can be either a creative product, which is communicated to and assessed by the creator's immediate society, or a creative experience that is often personal and assessed by only the individual. (2021, p. 691)	Product, person, process, place

Additionally, the dominant theories rarely mention the overall impact of the creative and/or innovative achievement in practical terms – simply an increase or maximisation – not all ideas are equal, and not all creative outcomes (even when maximised) will reach the same level of achievement. Those involved in the arts, product design, architecture etc. are often seen as “creative” as their achievements are not only large and noticeable but seen as unachievable by the majority. Writing a hit song, inventing the iPhone or painting a masterpiece could be seen as examples of ‘Big-C’ creativity in the terminology of Kaufmann & Beghetto (2009). However, by definition, these are not the only worthwhile creative achievements – everybody can be creative, and to some extent, everybody is creative. The vast majority of research behind the theories discussed in this thesis so far were not based on Big-C, world-changing acts of creativity, but on everyday ‘little-c’ examples of creativity such as coming up with ideas for new processes or alternative uses for everyday items. The Componential Theory (Amabile, 1983, 2012) does reference that there is a continuum of creativity, where not only the ‘big’ outcomes are valuable – this concept is supported by studies of ‘Big C’ and ‘little c’ (Kaufman & Beghetto, 2009). The importance of everyday ‘little-c’ creativity is highlighted as being absolutely fundamental to our lives, but unfortunately remains underacknowledged by the majority (Richards, 2007). Villanova and Cunha’s (2021) recent systematic literature review into everyday creativity calls for future research that aligns everyday creativity with the innovation process to demonstrate how ‘ordinary’ individuals can come up with useful solutions to meaningful problems. The authors also call for more research to better understand how everyday creativity occurs at the individual level.

This focus on ‘ordinary’ individuals, their differences, and everyday creativity is relevant to the current research as it is in the differing styles of creativity that the current research is interested, and in organisational settings which are not necessarily predisposed to Big-C style achievements. This research is keen to acknowledge that every individual is creative in some way - in a ‘little-c’ or ‘pro-c’ (Kaufman & Beghetto, 2009) way – and this research looks to better identify *how* somebody is creative... the way in which they prefer to approach creative problems. Specifically in terms of the choices an individual makes in how they engage in (i.e. Drazin et al., 1999), and how they habitually respond to (i.e. Villanova & Cunha, 2021), their daily tasks. Currently there is a lack of explanation in creativity theory as to how or where differing individual preferences ‘fit’, though it has been highlighted that Amabile & Pratt, Drazin, and Villanova & Cunha each make some reference to individual preferences or dispositions, few explicitly incorporate these into the theory and model.

Amabile and Pratt’s (2016) model refers to ‘Creativity Relevant Processes’ which they state include “cognitive styles, perceptual styles, and thinking skills that are conducive to taking new perspectives

on problems, pivoting among different ideas, thinking broadly, and making unusual associations; personality processes, traits, and characteristics that lead the individual to take risks and eschew conformity; and persistent, energetic work styles” (2016, p. 160) which, by this description would suggest alignment with the chosen working definition of creative style outlined in section 2.2.1. There is some lack of specificity around the definition of creativity related processes in the Dynamic Componential Theory and there is no clear definition of the creative styles which Amabile and Pratt deem to be relevant, how they impact upon the other parts of the model, or how different styles may impact upon different stages of creativity/innovation. However, based on the definitions and examples which are provided (see direct quote above) it can be theorised that creative style can fit into the creativity relevant processes area of the model due to the overlap with cognitive styles, thinking skills conducing to new perspectives, pivoting, thinking broadly, making unusual associations, characteristics of risk taking and conformity. However, the broad scope of these areas and vague definition means that creative style cannot possibly cover the entirety of behaviours/processes that could be associated with these, and additionally areas concerning personality processes and other traits may have little overlap with creative style. When providing examples of constructs which fit into this area of their model, the authors mention creative self-efficacy and trust in leader – interestingly, both things which are considered and measured at the individual level, yet are also influenced by external input such as leaders and leadership behaviours. The Dynamic Componential Model also acknowledges leadership influence in the pursuit of creative achievement. This is another area of interest for this thesis – as it is deemed to be of relevance to creative style in that the way you choose or prefer to engage in creative activity may include the support, motivation and leadership of others. In conclusion on this literature review point, there is such considerable overlap between creative style and Amabile and Pratt’s interpretation of creativity-related processes that this seems a logical ‘theoretical home’ for creative style in the existing creativity literature when existing models are considered.

In contrast to most theories of creativity, several theories of innovation follow more of a process-driven approach – whereby individuals are said to achieve innovative outcomes by following a (usually linear) process. A key difference between these theories of innovation and the creativity theories mentioned previously is that there is no specific mention of maximising innovation as an output – there is no requirement to maximise performance at every stage, or every antecedent factor in the process to obtain the optimal innovative output; the process of innovation is deemed to be relevant for both smaller ‘everyday’ innovation, and larger industry-changing innovation. It is worth noting that there are a number of papers discussing the ‘creative process’, thus giving creativity a more process-

driven structure, yet falling short of moving into the implementation stages of innovation (Binnewies et al., 2007; Drazin et al., 1999; Tolkamp et al., 2022). For example, Drazin et al.'s (1999) model (included in Table 2.1) does refer to creativity as a process rather than solely an end product, however, the purpose of the model is to introduce the concept of a multilevel model of creativity, without ever intending to cover implementation or innovation.

As outlined briefly in Table 2.2, each of the popular models from Osborn (1979) Amabile (1983, 1988), Amabile and Pratt (2016), Kanter (1988), Janssen (2000) and Axtell et al. (2000) utilise innovation processes which could be deemed to overlap with each other, covering elements of both idea generation and idea implementation/realisation in line with Hughes et al.'s integrative definition of creativity and innovation.

*Table 2.2 – Innovative Work Behaviour processes*

	Osborn (1979)	Amabile (1983, 1988); Amabile & Pratt (2016)	Kanter (1988)	Janssen (2000)	Axtell et al. (2000)
Stages of innovation process	Identify goal, wish or challenge	Task presentation			
	Gather data	Preparation	Innovation activation		
	Clarify the problem				
	Generate ideas	Idea generation	Idea generation	Idea generation	Idea suggestion
			Coalition building	Idea promotion	
	Select and strengthen solution	Idea validation			
	Plan for action	Outcome assessment	Idea realisation and innovation production	Idea realisation	Idea implementation

Through reviewing the dominant theories of creativity and innovation it can be seen that the creativity models largely focus on the outcome measure (such as idea generation) and how to maximise this. Although antecedents and predictors are discussed, there is little or no mention of the process of making creativity practical, or how exactly an individual may differ in their own pursuit of the act of being creative. Theories of innovation tend to be much more linear and process-driven, allowing more scope for investigation into how things are achieved at each step/stage of the process and are therefore more accommodating of 'everyday' or 'little-c' creativity as the scale and maximisation of

achievement are less intrinsic to the model – rather than being simply concerned with how much was achieved as an end result. It is suggested that these broader innovation theories provide a more natural ‘home’ to the accommodation of creative style in exploring how differing creative styles best fit at different stages of the innovation process, beyond idea generation alone. The current research (in line with recommendations for future research from Villanova and Cunha) aims to ground creative style within the wider theories of creativity and innovation, whilst focusing heavily on everyday creative achievement which can be generalisable to a wider population.

Given the nature of the research conducted within this thesis, and the fact that, to date, most creative style research has not been grounded in creativity/innovation theory (this is explained fully in section 2.2), the present research requires a theoretical model which accommodates both creative and innovative activity relating to the individual in the workplace. As such, upon reviewing the relevant theories and where each model sits in terms of focusing on the maximisation of idea generation, through to a full explanatory process model of innovation, it was decided to base the current research within Amabile’s 1983 and 1988 Componential Model of individual innovation, updated to the Dynamic Componential Theory in 2016 (Amabile & Pratt, 2016). Osborn’s (1979) model of creative problem solving (CPS) also covers a number of linear stages which encompass more than idea generation alone – however, this model was developed as a framework for building successful creativity training interventions within organisations with subsequent research validating the impact of the process focusing on its usage in this context (Puccio et al., 2005). Whereas the Amabile and Pratt model encompasses a larger context than a training process alone, along with substantial detail regarding individual antecedents and how each can impact upon the different stages of creativity and innovation. Now known as the Dynamic Componential Theory, this comprehensive model of creativity and innovation in organisations theorises the dynamic interaction of individual or small-group creativity with organisational innovation, as well as the antecedents and stages of each. The full model is illustrated in Figure 2.3, this 2016 version of the model (Amabile & Pratt, 2016) is a significant development of the original Componential Model (Amabile, 1988), with the purple parts reflecting the elements present in the original model, with green parts indicating the elements which have been added or amended. The model can be broadly summarised as such:

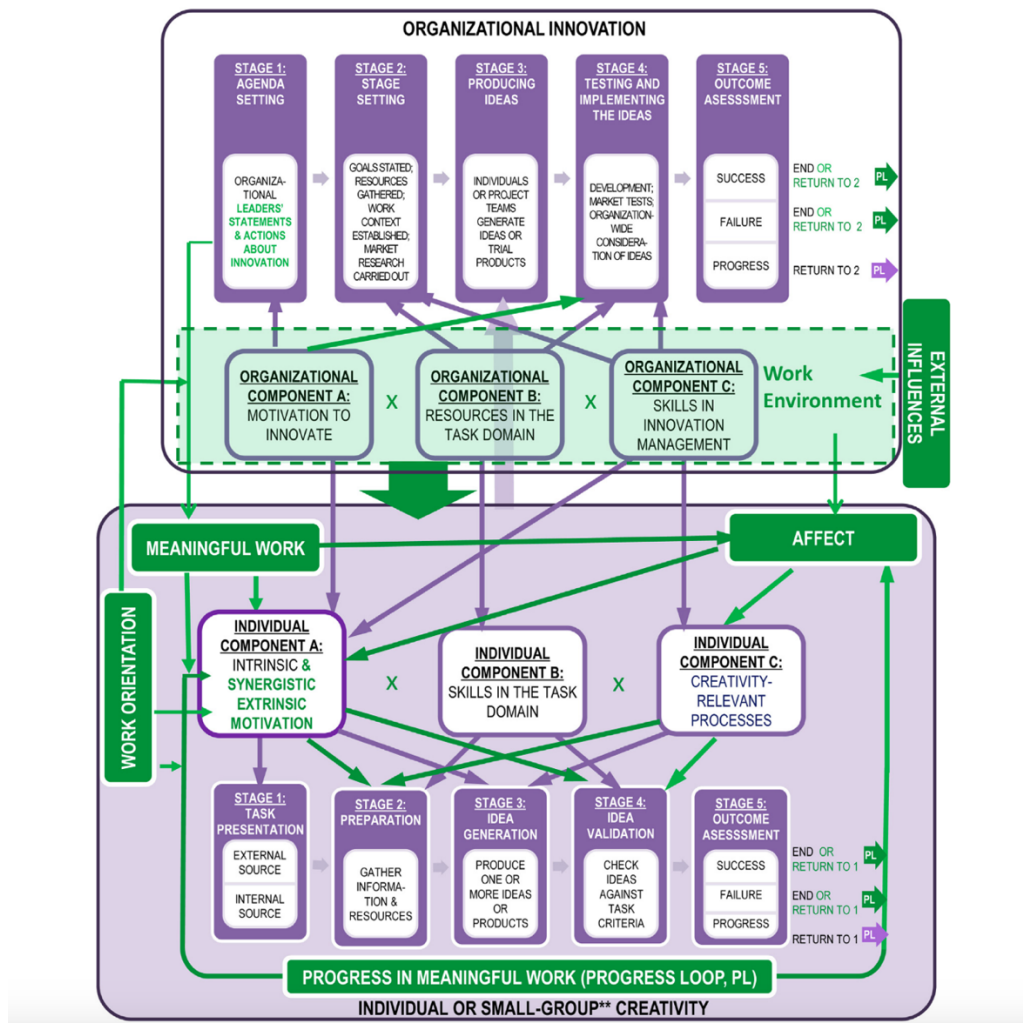
- Individual or small-group creativity is achieved through three individual components; motivation (both intrinsic and synergistic extrinsic), skills in the task domain, and creativity relevant processes. These individual components in turn impact upon the five stages of individual or small-group creativity, namely; task presentation, preparation, idea generation, idea validation and outcome assessment.

- Organisational innovation is achieved through three organisational components; motivation to innovate, resources in the task domain, and skills in innovation management. These organisational components in turn impact the five stages of organisational innovation, namely; agenda setting, stage setting, producing ideas, testing and implementing the ideas and outcome assessment.
- Additionally, components of organisational innovation are stated to impact upon components of individual or small-group creativity with more elements added to the latest version of the model, namely; external influences, work environment, meaningful work, work orientation, affect and a progress loop all contribute additional influence on the established components of organisational innovation and individual or small-group creativity.

For the purposes of the current research, the logical 'home' for creative style in this model would be within the individual component of 'creativity-relevant processes' which is theorised to influence individual or small-group creativity at three different stages: preparation, idea generation and idea validation. This logic will be explained in greater depth in the subsequent section (2.2.1) which defines and outlines the parameters of what we mean by creative style.

The decision was made to ground the current research in this model due to the fact that the model includes the full innovation process, yet also includes a specific focus on what would typically be covered in a creativity model, referenced in the 'idea generation' stage. There is suitable alignment of definitions between the current research and the existing theory, as well as the stages of the theory providing enough depth and detail to cover the broad range of creative styles, employment sectors and required job outcomes of the current research participants. As will be covered in greater depth when specifically discussing creative style and its measurement (section 2.2.4), the existing literature has not used this model to support the concept of creative style – research has aligned creative style to a creative problem solving framework (e.g. Puccio, 2002), yet to date, no other research has aligned creative style to a model such as the Dynamic Componential Theory (Amabile & Pratt, 2016) which covers behaviour across the entire range of the creative/innovative process.

Figure 2.3 - The Dynamic Componential Theory of Creativity and Innovation taken directly from Amabile and Pratt (2016, p. 165)



#### 2.1.4. Antecedents of creativity and innovation

This final section on the creativity and innovation literature briefly touches upon the identified antecedents of creativity and innovation. The purpose of this, and relevance to the current research on creative style, is to highlight some of the other constructs that have been found to have strong relationships with creativity and innovation – given that much of the literature concerning creative style is either lacking theoretical grounding (see section 2.2.1) or is measured in isolation, it is useful to consider how other constructs do fit within existing theories and contribute to the wider theory of creativity and innovation – to use this knowledge of better defined and extensively researched constructs to inform the development and exploration of our understanding of creative style.

Many antecedents to creativity have been positioned in theoretical frameworks (as per those in Table 2.2), as well as explored through empirical research. A review of the literature highlights that some of the more prevalent and established antecedents seen to predict increased creative performance include; high intrinsic motivation (Amabile, 1988; Amabile & Pratt, 2016; Ford, 1996; Gong et al., 2017; Shin & Zhou, 2003; Woodman et al., 1993), high extrinsic motivation (Amabile, 1988; Amabile & Pratt, 2016; Gong et al., 2017), high levels of relevant task skills and knowledge (Amabile, 1988; Amabile & Pratt, 2016; Howell & Boies, 2004; Woodman et al., 1993), high creative self-efficacy (Jaussi et al., 2007; Jaussi & Randel, 2014; Lee et al., 2019; Richter et al., 2012; Sitar et al., 2016; Tierney & Farmer, 2002, 2011), high levels of positive affect (Amabile et al., 2005; Gilmore et al., 2013; Jaussi et al., 2017; Parke et al., 2015), particular leadership styles – specifically transformational leadership which has been found to correlate with increased creative performance in followers, a topic that will be covered in much greater detail in section 2.4.3 (Bono & Judge, 2003; Deichmann & Stam, 2015; Gong et al., 2009; Jaussi & Dionne, 2003; Keem et al., 2022; Pieterse et al., 2009; Qu et al., 2015; Shin & Zhou, 2003; Tierney, 2008), and certain personality traits, such as openness to experience among others, are deemed to be “creative”, “positive” or “proactive” (Alikaj et al., 2021; Batey et al., 2009, 2010; George & Zhou, 2001; Hughes et al., 2013; Kim et al., 2009; Madjar et al., 2002; Raja & Johns, 2010; Zhou et al., 2022).

These antecedents are predominantly at the individual level – however, there are others at the interpersonal, team and organisational levels. Of particular interest to the current research is that of personality traits; firstly, due to their extensive prevalence in the creativity and innovation literature; secondly, due to their obviously positioning as a ‘creativity related process’ as defined in the Dynamic Componential Theory; and finally, as one of the rare constructs which has been subject to empirical published research alongside creative style (Cheng et al., 2010; Gelade, 2002; von Wittich & Antonakis, 2011) making this a key construct to consider in terms of making links between creative style and other areas of the creativity literature as there is a level of extant knowledge to recognise and build upon. The specific relationships already identified between creative style(s) and personality trait(s) are discussed in greater detail in the chapter focused on creative style (2.2). Also of interest to the current research is leadership which could be considered a factor at the individual level (i.e. considering the creative style of somebody in a leadership position given the differing expectations and requirement they have in their role compared to others in the workplace), or at the interpersonal level in terms of how the creative style of a leader relates to the creative performance or other outcomes variable of their team members / followers given the influence a leader has over their followers. This relationship between creative style with leadership and leadership style is a relative



gap in the literature and our knowledge, with Isaksen et al. (2003) providing the only discoverable published research directly looking into creative style and leadership – establishing that although the KAI and leadership behaviours should be distinct (based on Kirton’s claim that creative style is distinct from performance), they were actually found to be significantly positively related.

#### **2.1.5. Summary**

This section explored the definitions of creativity and innovation, before settling on a working definition for the current research which encompasses elements of both creativity and innovation in a single process. The wider literature on creativity and innovation was introduced, briefly explaining the dominant theories whilst highlighting the common themes within them; namely that creativity theory generally focuses on increasing output quantity (and quality in terms of originality of ideas), innovation theory generally focuses on a process model regardless of output quantity, and both often neglect the role of specific individual working preferences such as creative style. An aim of this thesis and the associated research was positioned – to contribute to the knowledge of creativity and innovation through the greater understanding, and inclusion, of creative style within the theoretical frameworks of creativity and innovation – the specific framework selected as the mechanism for this development of understanding is the wide-reaching Dynamic Componential Theory which addresses creativity and innovation at multiple stages whilst incorporating an element of individual differences in the process. Finally, some of the more established antecedents to creativity and innovation were introduced due to their enduring presence in the creativity and innovation literature, adding further clarity to the area relevant to creative style if it is to be better integrated into the wider literature.

### **2.2. Development of Research Question 1: Measurement of creative style and its relationship with other relevant constructs**

This section provides an overview of the main focus of this thesis and associated research – creative style. Five key areas will be covered throughout this section:

- First, the construct of creative style will be defined;
- Second, clarification will be provided in terms of how creative style is distinct from other existing constructs such as creative personality;
- Third, creative style will be considered in the context of the wider creativity and innovation literature to determine where it logically ‘fits’ within the existing theoretical frameworks;
- Fourth, a review of existing measures of creative style will be presented, as well as introducing an alternative measure, the Creative ID;
- Finally, based on the definition, literature and measures – a research question will be formulated.

### **2.2.1. Defining creative style**

There are a range of definitions of creative style throughout the literature, many of which make reference to the work of Kirton and the Adaption-Innovation Inventory ([Kirton, 1976, 1987, 1999](#)), which demonstrates the position and prestige that Kirton's work has in this field as the dominant tool for measuring creative style. Kirton notes that "all people solve problems and are creative ... people differ in the style in which they are creative, solve problems and make decisions. These style differences, which lie on a normally distributed continuum, range from high adaption to high innovation" (Kirton, 2003, p47). Kirton's work goes to great lengths to distinguish between an individual's creative style (the way in which they are creative) and their creative ability or outcome (how much / quality of creativity achieved). For example, two people may perform equally on measures of creative outcome (i.e. coming up with the same number of ideas), yet one person may have come up with all of their ideas from scratch (in Kirton's terminology, an 'innovator'), whilst the other took existing ideas and tweaked them to create something new (Kirton's 'adaptor'). Generally, creative style definitions tend to focus on these two key features – firstly, that creative style should be distinguished from creative outcomes (such as idea generation); and secondly, that everybody has a creative style which clarifies how an individual prefers to be creative.

In terms of differentiating creative style from levels of creativity, Houtz et al. state that creative style looks at "... the ways in which individuals create, rather than at absolute amounts of creative achievement" (2003, p. 288), this is supported by Isaksen who outlines that "[Creative] level includes a focus on ability, magnitude, or competence. [Creative] Style focuses on preference, mode, or predilection. This conceptual distinction separates a focus on level or capacity (how creative are you?) from a focus on style or preferred modality (how are you creative?)" (2004, p. 233). This from Isaksen and others makes an important point in not just differentiating creative style from a measurement of creativity, but to also highlight that there is not always a relationship between the two – specifically, every individual will still have a creative style (how they prefer to approach creativity) regardless of how much creativity they actually achieve. This is defined more specifically in the literature when referring to the KAI and other style measures which "are typically designed to place the respondent into one of several qualitatively different categories based on the preference for behaving in a certain manner" (Fleenor & Taylor, 1994, p. 465). Though it should be noted that even though creative style is distinguished from creative performance or ability – with Kirton explicitly stating that the assumptions of Adaption-Innovation Theory (which underpins his measure of creative style) stating that creative style is "unlike [creative] capacity, to which it is unrelated" (Kirton, 2003 p46) – it should not be ignored that some styles better lend themselves to certain tasks, or stages of the

creative/innovative process than others, which has been shown through the use of Kirton's tool in empirical research (e.g. Wang et al., 2017) as well as recognised by Kirton himself in stating that "every location on the style continuum has its advantages and disadvantages depending on the problem solving context" (Kirton, 2003 p46). This will be addressed accordingly throughout this chapter, yet the distinction remains that creative style is not synonymous with creative ability, although there is a logical connection between what you tend to do and what you are good at, the relationships and correlations between specific creative styles and particular creative outcomes are proposed to be more nuanced.

As stated in the Dynamic Componential Theory (Amabile & Pratt, 2016) both motivation and creativity relevant processes are mechanisms by which positive creative and innovative outcomes can be achieved – motivation would be seen as something which informs an individual's working preferences (Amabile et al., 1994) and creative style is (partly) defined by an individual's working preference as well as sitting within the broad realm of creativity relevant processes. To clarify, the position of the current research is that, by definition, creation style is expected to have relationships with creative/innovative performance, though not because creative style and creative ability should be considered one and the same construct, it is simply that styles highlight the process by which the creative outcome is achieved. This brings us to Dubina's rather succinct definition that incorporates the key elements discussed, whilst bearing in mind the relevance of three of the most popular measures of creative style – those developed by Kirton, Basadur and Puccio (to be discussed in greater depth in section 2.2.4). As such this will be the basis for the working definition of creative style adopted for the current research:

*"Creative styles are individual preferences or approaches in which people are creative, solve problems, and make decisions" (Dubina, 2013, p. 350).*

Upon reviewing the existing definitions of creative style and determining which could be considered the best fit for the current research, the previously discussed definitions of creativity must also be taken into account. By taking Hughes et al.'s (2018) integrative definition of creativity and innovation identified in the previous chapter, and incorporating Dubina's (2013) creative style definition; the following working definition can be utilised for the work context:

*'Creative styles are individual cognitive or behavioural modes or approaches in which people attempt to be creative and/or innovative – that is, in their attempts to generate novel ideas and*

*implement new ideas, which could include problem/opportunity identification, the introduction, adoption or modification of new ideas, promotion of ideas and practical implementation'*

### 2.2.2. What is creative style not?

Having established a working definition for creative style, this chapter section provides further clarification for the focus of the research presented within this thesis – specifically, by eliminating similar or related constructs which could possibly be seen to fit within the chosen definition. These alternative constructs include personality, creative personality, proactivity, and team roles. Each will be discussed in turn, with justification as to why creative style differs in nature and/or measurement. Table 2.3 provides a brief summary of the differing constructs which could be assumed to be synonymous with creative style; including (where applicable) definitions, measurement methods, and what each construct predicts/correlates with. Any correlations or other relationships stated in the table are considered to be statistically significant. The remainder of this section of the thesis will then refer back to this table and its contents to add additional depth to the information provided and, most importantly, to clarify how each construct differs from creative style.

*Table 2.3 – Overview of constructs to be differentiated from creative style*

Construct	Definition/description	Measures	Predicts or correlates with
Creative personality	“Personality is the relatively enduring unique ways that individuals think, act, and feel.” (Feist, in (Carayannis, 2013, p. 345) Creative personality is a subset of personality traits which correlate with higher creative performance.	Gough’s Creative Personality Scale (1979)  A checklist including items such as capable, confident, resourceful and unconventional.  Alternatively, the openness to experience trait from the ‘Big 5’ (Costa & McCrae, 1985, 1992) has been used as a measure of creative personality.	Synonymous with openness to experience (Simner et al., 2022)  Positively correlates with creative performance (idea generation and novelty) (Martinsen, 2011)
Proactive personality	individuals’ disposition toward engaging in active role orientations, such as initiating change and influencing their environment” with “an active rather than passive approach toward work”	Scales such as those developed by Seibert et al. (2017)  Include items such as “If I see something I don’t like, I fix it”	Positively correlates with creative performance as per Zhou & George’s (2001) scale including items such as “Suggests new ways to achieve goals or objectives,” “Searches out new technologies, processes, techniques, and/or product ideas,” and “Comes up with new and practical ideas to improve performance.”

Creative ability	Higher ratings of creative ability are quantified through higher performance on creative tasks such as idea generation.	Idea generation Novel uses etc.	n/a this is a measure of creative performance as an outcome
Creative motivation	Links back to the Componential Theory of Creativity (Amabile, 1983, 1988; Amabile & Pratt, 2016) which references motivation as a predictor of creative achievement (specifically intrinsic motivation and synergistic extrinsic motivation).	Work Preference Inventory (Amabile et al., 1994)) including items such as “Curiosity is the driving force behind much of what I do” and “It is likely for me to receive monetary rewards for good creative ideas”	Both intrinsic and synergistic extrinsic positively correlate with self-report measures of creative performance (C. Fischer et al., 2019)
Team roles	The types of behaviour in which people engage are infinite. But the range of useful behaviours, which make an effective contribution to team performance, is finite. These behaviours are grouped into a set number of related clusters, to which the term 'Team Role' is applied. (Belbin, 2023)	Belbin Team Roles	General team performance, not creativity/innovation specific (Henry & Todd Stevens, 1999; Senior, 1997)

Personality is a well-researched area, with established and respected measures such as the “Big Five” (Costa & McCrae, 1985; McCrae & Costa, 1997) of openness to experience, conscientiousness, extraversion, agreeableness and neuroticism. These are deemed to be traits that are relatively stable over time (Costa et al., 2019) though research has found that personality traits can change over time either through reaching older age (Debast et al., 2014), or following the experience of certain life events such as unemployment (Boyce et al., 2012, 2015), job insecurity and demands (Wu, 2016; Wu et al., 2020), or general life ‘transitions’ including entering the working world, beginning a relationship or starting university (Leikas & Salmela-Aro, 2015). It could be argued that changes in personality over time, or indeed the stability of personality over time, is dependent upon the definition of personality being used (Ardelt, 2000) or the (in)consistency of measures across time (Costa et al., 2019). There is also a wealth of research linking certain personality traits to creativity (Batey et al., 2009, 2010; George & Zhou, 2001; Hughes et al., 2013; Raja & Johns, 2010), however, although there are relationships between personality traits and creative output, or even personality traits and creative style (Cheng et al., 2010; Gelade, 2002; Wang et al., 2017), these are generally considered to be distinct constructs – there may be relationships between certain creative styles and personality style, but they are not thought to be one and the same construct (Wang et al., 2017). Taking a definition of personality, we can start to highlight the differences between personality and creative style:

*“An individual’s personality is the enduring set of Traits that he or she exhibits, which characteristics represent (a) dispositions (i.e., natural tendencies or personal inclinations) of this person, and (b) ways in which this person differs from the “standard normal person” in his or her society.” (Bergner, 2020, p. 4)*

Firstly, we can see that personality is defined as being an enduring set of traits (although as previously stated, recent research is challenging this view). The trait or state nature (i.e. changeability over time) of creative style has not yet been established and is something to be addressed by the research presented in this thesis. Kirton’s interpretation of whether creative style is changeable over time is inconclusive, stating both that creative style is related to personality traits, is stable and not altered by learning or training (Kirton, 2003, p46) as well as creative style being “modified... for limited amounts and limited periods, when the need is perceived” and can be simulated through effective cognitive techniques (Kirton, 2003, p46). Secondly, personality is extremely broad, referring to the dispositions of an individual and a way of seeing differences from a societal norm. In contrast, creative style is much more specific, focusing on the individual’s working preferences (Kirton, Creative Creatures, and others state that their tools are designed for adults with working experience) and even more specifically, their preferences in the way in which they prefer to be creative. The measurement of creative style does not claim to illustrate anything beyond these defined boundaries i.e. into life away from work, or in pursuits other than creativity (Kirton, 1976, 1987, 1999).

This mention of the breadth of personality in its definition brings us to more niche subsets of personality known as creative personality and proactive personality. Creative personality originated in the work of Gough who recognised the trend for “methods of assessment that can identify creative talent and potential within the individual” (Gough, 1979, p. 1398) and therefore created a creative personality scale to obtain “direct or inferred ratings of creativity” (Gough, 1979, p. 1398). Put simply, this is a list of adjectives that individuals choose from, deciding which best describe them. A number of these adjectives are thought to indicate a predisposition to creative ability (such as capable, intelligent, insightful, original, etc.), and therefore contribute to a higher rating of ‘creative personality’. Although created in 1979, this method of creative personality measurement is still in use, and unchanged, in both well cited (Carson et al., 2005; Gino & Ariely, 2012; Madjar et al., 2002; Zhou, 2003), and up-to-date research (Chen et al., 2023). Alternative methods of measuring creative personality also simply use a subset of a wider measure of personality, determining either a single personality trait as accounting for ‘creativity’ in the case of selecting one of the ‘Big Five’ personality

traits - openness to experience (Simner et al., 2022); or as a combination of two personality traits in the case of the 'creativity' and 'unconventionality' subscales of the HEXACO personality measure (Ashton & Lee, 2007; Zhang et al., 2021). In the case of the latter, it is unclear why the subscale of 'creativity' is not deemed broad enough to measure creative personality by itself, though delving into a full critique of this particular measure would detract from the focus of this thesis chapter.

As in the general sense of personality, the subscales used to measure creative personality look to establish traits that are enduring and tied to one's sense of self, this is not something creative style looks to explicitly address due to its focus on the specific act of being creative – that is, in their attempts to develop and introduce new and improved ways of doing things which result in potential benefits at work. Creative personality, as it is discussed in the literature, does not specifically focus on action or behaviour, especially not in the context of a preference or tendency for how an individual goes about attaining creativity. Personality comes from an "I am" statement, whereas style comes from "I do" or "I prefer". Additionally, although creative personality is more focused on creativity than a general measure of personality, it does not focus specifically on creativity in the workplace, nor does it give any insight into specific working preferences.

In contrast, proactive personality is very workplace focused, defined as "individuals' disposition toward engaging in active role orientations, such as initiating change and influencing their environment" with "an active rather than passive approach toward work" (Kim et al., 2009, p. 94). There are similarities here with creative style in that it is work-focused and also does not claim to be an enduring trait over time. Research has found proactive personality to predict self-report creative performance (Alikaj et al., 2021; Kim et al., 2009) though the construct itself is not specifically intended to relate solely to creative behaviour in the workplace, and can be related to any workplace context and behaviour. Therefore, two key distinctions can be identified which differentiate creative style from proactive personality – firstly, in one sense creative style is more specific in that it is concerned with creative behaviour preferences only, not the full range of behaviour exhibited a workplace setting; secondly, it is broader in that it is not only concerned with high levels of activity and a focus on change, creative style encompasses behaviours that could be deemed either proactive, reactive or both.

Finally, team roles, such as those outlined by Belbin (Belbin, 1993, 2011, 2013) refer to "the ideal team as a group of individuals who could fulfil the eight, and later nine, team roles which he had identified." The implication being that there are a number of roles an individual can play in a team, and there is a

hypothesised 'ideal' team which includes all of the roles or styles identified. At first glance, some of the team roles identified bear a resemblance to creative styles due to commonality around divergent thinking and idea generation, logical decision making, and teamwork. Despite these similarities across selected roles/styles, there are fundamental differences in the constructs. In Belbin's work, all team roles are considered to be essential for the formation of the ideal team – firstly, this differs from the concept of creative style in that it is clearly focused on how an individual contributes to a team dynamic, whereas creative style is focused on how an individual contributes to creativity. Secondly, none of the creative styles are seen to be essential for success, it is simply an indication of a preferred working style, not a requirement for success (Brinkman, 1999).

In summary, this section has aimed to further clarify the focus of creative style of the individual, in the workplace, working toward creative activity, and that it is a measure of preference that may or may not be changeable to some extent over time. These distinctions in definition allow creative style to be distanced from the alternative constructs discussed – there may be correlations or relationships between creative styles and personality traits / creative personality / proactive personality / team roles; this is yet to be determined through further empirical research, but the constructs themselves are not considered synonymous based on current definitions.

### **2.2.3. Where does creative style fit?**

As this chapter aims to highlight, despite there being measures of creative style dating back to the 1970s, compared to other areas of creativity and innovation, it has not been extensively researched, nor grounded in established theory - in 2003 (almost 30 years after the formation of Kirton's measure of creative style) it was stated that "creative style is a new topic in creativity research." (Houtz et al., 2003, p. 288) and as can be seen in a literature review later in this thesis (section 2.2.4) research involving creative style and the measurement of this construct is still limited. Following the review of current theories of creativity and innovation, this section outlines a common omission from the theories – the role of individual differences in terms of the preferred behaviours of an individual in their contribution to the creative/innovative process – known as creative style. Firstly, the significance of this omission will be highlighted, before explaining how the current research aims to contribute to theory and knowledge by addressing this gap.

In reviewing the dominant theories in the field, some include individual differences in their models – the Componential Theory and Dynamic Componential Theory (Amabile, 1988; Amabile & Pratt, 2016) include individual motivation, skills in the task domain and creativity relevant processes which, as



defined previously (section 2.1.3) include individual preferences and patterns of behaviour and working; the Interactionist Perspective (Woodman et al., 1993) includes individual motivation and cognitive abilities; and finally up to date with Everyday Creativity (Villanova & Cunha, 2021) stating that the 'person' must be considered. However, these are seen as antecedents to creative performance, whereby increasing levels of these should, in theory, contribute to an increase in creative output. Is it inconclusive as to whether this reflects the nature of creative style – (as detailed further in section 2.2.1) there are contrasting views as to whether creative style is directly related to creative performance. Creative style refers to the individual preferences, modes or approaches in which people prefer to be creative – that is, in their attempts to develop and introduce new and improved ways of doing things which result in potential benefits; it is simply an individual preference for one way (or style) of working over another. Many antecedents to increased creative performance have been identified and, by its very nature, it is diverse (in that it focuses on identifying and implementing novel solutions/contributions) and reliant upon individuals. This is significant as the research shows that creativity can be achieved in a number of ways by individuals (Kirton, 1999; Puccio, 2002), and to varying extents and magnitudes (Kaufman & Beghetto, 2009). Yet, these different ways of achieving creativity, especially the more 'everyday' or 'little-c' achievements have not been researched in sufficient detail (Villanova & Cunha, 2021) – in the same way that individual creative style does not explicitly feature within the theories and models of creative performance; there is literature on creative style and how to measure it, yet it is not explicitly linked back to creativity theory and/or creative performance. There is a disconnect in the literature, and our existing knowledge, regarding how people prefer to be creative, and how this relates to the wider creative/innovative process and performance. To a certain extent, comparisons can be made here between the creativity and leadership literature – where historically, leadership was measured in terms of output (as is currently the case with creativity) and research predominantly looked to establish antecedent traits which were related to higher levels of performance, discovering which people were best placed to be leaders, or which conditions needed to be increased/decreased to achieve better outcomes. Now, the leadership literature is full of research on leadership style, it is recognised that everybody is capable of leading, and that people have differing styles in terms of the behaviours that they employ when leading others – for example, people that employ a 'transformational' leadership style act as role models, promoting innovation, growth and empowering their followers; whereas a 'transactional' leadership style is more associated with simple exchange relationships involving rewards for achieving goals and corrections for poor performance (Bass & Avolio, 1997; Bass & Riggio, 2006; Eagly & Carli, 2003; Rafferty & Griffin, 2004). These styles (as well as many others present in the leadership literature, a number of which are discussed in section 2.4.2)

may be seen as more or less appropriate in achieving positive leadership outcomes depending on the context that they are being used in (Antonakis & Day, 2018). This leap in the research focus from looking solely at outcome measures, to the inclusion of individual styles, defining these, and exploring what they mean for the wider process has not yet occurred in the creativity literature. Researching creative style, as per the research presented in this thesis, and finding its place in the established theory is one of the theoretical contributions which this thesis aims to contribute. At the time of writing, research had just been published regarding leadership styles – Fischer & Sitkin's (2023) review of multiple measures of leadership style concludes with a call for future research to explicitly distinguish between the intended behaviours of a leader and the actual behaviours of a leader. This latest direction in the leadership style literature is acknowledged and covered in greater detail in the relevant chapter and subsequent discussion (see section 5.6).

To date, the literature on creative style suggests that it should be considered entirely separately from creative performance and creative ability (Brinkman, 1999; Houtz et al., 2003; Isaksen, 2004; Kirton, 1976, 1987, 1999) and as such the construct of creative style has not been aligned to creativity or innovation theory. It has been defined and measured, though to what end is unclear – if it is a style of working creatively, yet has no relationship with creative performance, what exactly is it measuring? What does a measure of creative style tell us that has practical significance in the workplace? This is what the current research set out to address – to assess a measure of creative style which is aligned to creativity/innovation theory by broadening the existing definition and parameters of creative style, to explore which creative styles are associated to which stages of the creativity/innovation process in terms of performance; and, to contribute to the wider creativity literature by proposing the addition of creative style to an existing model of creativity and innovation to aid the understanding of individual creative behaviour and how this contributes to creative performance in the pursuit of beneficial organisational outcomes.

#### **2.2.4. Measurement of creative style: Systematic literature review 2 and overview of identified measures**

Currently there is no discoverable review of creative style measures which is comprehensive – Houtz et al. (2003) compare two measures, the KAI and Creative Problem Solving Process Styles. However, there is no discoverable review which addresses the multiple measures available in the literature whilst comparing their respective reliability and validity statistics, methods of measurements and definitions of creative style. Therefore, the second systematic literature review of this thesis was conducted in response to the following research questions:

- How is creative style currently measured in an organisational context?
- What are the prevailing tools for measuring creative style in an organisational context, and how reliable and valid are they?

Using the Web of Science database, a search was conducted using the following 'topic' search term *"creative style" OR "creativity style" OR "creative measure" OR "creativity measure" OR "measure of creativity"* which initially returned 316 search results. The search was further refined to include 5 decades of research (1972-2022 inclusive – returning 312 results) and was further refined by; article type (articles, review articles, books, early access and other – returning 267 results) and language (English). This returned 172 articles of interest. From reviewing the abstracts of these articles, further criteria for inclusion were applied to ensure the relevance of the literature to the present research. These criteria were that the research involved adult participants, in an organisational or workplace context (to remove measures of artistic creativity such as writing style, dancing style, painting style, musical style etc. – though student samples were included), and that a measure of creative style, tendency or preference was clearly stated. This filtering process left 31 articles remaining which were reviewed in greater detail by reviewing the full article and resulted in a further 6 being discounted as the measures used were in fact measures of creative ability or creative personality.

This left 25 papers\* in the literature search whereby the method of measuring creative style can be determined. Of these;

- 21\*\* included the Kirton Adaption-Innovation Inventory (KAI) – (Kirton, 1976, 1987, 1999)
- 2\*\* included Creative Problem Solving Process Styles (Basadur et al., 1990)
- 2 included the Creativity Style Questionnaire-Revised, or CSQ-R (Kumar et al., 1997)
- 1 included the FourSight Thinking Profile (Puccio, 2002)

\*The 25 relevant papers discovered are listed in Appendix 1

\*\*1 paper included both the Kirton and Basadur measures

To complement this systematic literature review, further searches for reviews and meta-analyses of creativity research were conducted in an attempt to find other quality measures of creative style, or provide greater insight into the current understanding of creative style. These searches further supported the conclusion that there has been very little research published to date – Williams et al.'s (2016) paper looked to map the themes, impact and cohesion of creativity research from 1990-2015 and makes no reference to 'style'. In a similar analysis of the literature, Zhang et al. (2015) looked to map the key areas of research in creativity through analysis of article keywords. It is noted that the

keyword 'style' appears in just 25 of 4,575 creativity papers reviewed from 1992-2011 (the 163<sup>rd</sup> most common keyword in the creativity literature). Anderson et al's (2014) well cited and detailed review of innovation and creativity research which includes multiple suggestions for future directions of research, makes no mention of creative style as it is defined in the current research. Finally, Villanova & Cunha's (2021) ten year systematic literature review of everyday creativity makes no reference to creative style. This may beg the question, 'so what?'. Maybe there is a reason why creative style does not feature prominently in the research, and that is because there is not anything interesting or significantly beneficial to be obtained by researching the topic. The position of the current research is that creative style, when measured in a suitably detailed and robust way, will give us greater insight and understanding into how people prefer to achieve creativity, as well as understanding the potential impact these differing preferences or styles have on creative performance at different stages of the creative/innovative process. To date there has been a disconnect between the measurement of creative style, the measurement of creative outcomes, and a link to established theory. By looking at more detailed ways of measuring creative style, by considering creative output as more than idea generation, and by grounding these measures in existing and accepted theory, the current research aims to bring about greater understanding of how individual differences in creative style contribute to meaningful outcomes for individuals and organisations.

Table 2.5 and the subsequent critiques give an overview of the creative style measures found in terms of their format, reliability and validity – included are those from the literature review (listed by order of prevalence in the literature), and some popular commercially available tools which are worthy of inclusion for reference due to their prevalence and usage in the market. These commercial tools were identified through searching those registered on the British Psychological Society's register of psychometric tools, through word of mouth recommendations from practitioners working in the creativity/innovation field, and through further Google searches for measures of creative style. These tools currently set the benchmark for measuring creative style in terms of being the most robustly created and most frequently used in literature and the wider commercial market. Finally, the Creative ID tool is included – this tool has been created by Creative Creatures and (as explained in Chapter 1) is the tool used as a measure of creative style in the current research. The background to how this tool originated and has developed over time is discussed in detail in section 2.2.5 – the suitability of this tool in comparison to the existing measures will be discussed objectively throughout this thesis, both in terms of meeting the levels of reliability and validity expected by psychometric measures, and in addressing gaps and developmental needs of those measures.

When referring to the validity of a psychometric instrument, the work of Hughes (2018) is instrumental in distilling what can be perceived as a complex and often not clearly defined area, into a succinct and practical framework. As with most areas of research, there are conflicting views on exactly what constitutes validity and how it should be defined and measured, with Hughes going into detail on the history and subsequent suggestions for future directions of this issue (referencing the work of Borsboom et al., 2004; Cizek, 2012, 2016; Kane, 2006, 2016; Sireci, 2016) and settling on two fundamental questions that should be considered when determining the validity of a measure: '*Is it accurate?*' i.e. does it measure what it is supposed to; and '*Is it useful?*' i.e. is it appropriate for use in a specific context, for a specific purpose and with a specific population (Hughes, 2018). These guiding questions then inform a framework encompassing four types of evidence to consider when determining accuracy; and eight when determining appropriateness. Definitions of each of these types of evidence, as provided by Hughes are stated in Table 2.4. It is also noted that based on the sample of psychometric measures included in Hughes's work some of these sources of evidence would be considered 'standard' or commonplace – showing up in over 80% of the research sample (such as structural and discriminant); though in contrast evidence of response processes, consequences and feasibility were not provided in any of the research papers sampled. This demonstrates the varied approach to validity currently applied in practice, with a 'gold standard' of obtaining evidence for all listed sources of validity rarely, if ever, achieved. Throughout this thesis it will be noted which sources of evidence were pursued and deemed achievable when assessing psychometric measures, as well as identifying which other sources could be considered in future research to further strengthen the grounding of the measure.

*Table 2.4 – Types of evidence for establishing psychometric validity*

To establish	Type of evidence	Definition
Psychometric accuracy	Content	The degree to which the content (i.e. items, tasks) of a psychometric measure comprehensively captures the target construct.
Psychometric accuracy	Response processes	The mechanism by which the target construct causes item responses.
Psychometric accuracy	Structural	The degree to which the relationships among psychometric content (items, tasks) reflect the theoretical framework.
Psychometric accuracy	Stability across groups	The degree to which the content, structure, and response processes remains stable across groups.
Psychometric appropriateness	Convergent	The relationship between psychometric measures of a construct and other measures of the same construct.
Psychometric appropriateness	Discriminant	The relationship between test scores and scores on measures assessing different constructs.
Psychometric appropriateness	Predictive	The ability to longitudinally predict criterion scores based on test scores.

Psychometric appropriateness	Concurrent	Cross-sectional prediction with both predictor and criterion data collected at the same time.
Psychometric appropriateness	Incremental	Improvements in prediction of a criterion variable added by a particular test over and above other measures.
Psychometric appropriateness	Known groups	The extent to which a psychometric measure correctly discriminates between those known to be low and those known to be high in a construct.
Psychometric appropriateness	Consequences	The intended and unintended consequences of test use.
Psychometric appropriateness	Feasibility	The practical concerns related to psychometric use.

*Table adapted from Hughes (2018, pp765-770)*

In addition to the types of evidence outlined, Table 2.5 reports some additional forms of ‘evidence’ as published in the research. These include face validity refers to whether the tool ‘feels’ right, that it seems to measure what it sets out to measure and is generally determined by expert raters in a relevant area. Also, construct validity refers to how well aligned a tool is to alternative established tools in a similar area with expected relationships observed, or “is ordinarily studied when the tester has no definite criterion measure of the quality with which he is concerned, and must use indirect measures” (Cronbach & Meehl, 1955, p282) – for example, how well a measure of intelligence aligns to school test results, though these have been reported for completeness it is acknowledged that to some “it is not entirely clear what this ‘evidence’ is, if any” (Hughes, 2018, p771).

Table 2.5 – Creative Style Measures Comparison

Tool	Items	Dimensions	Testing Population	Structural	Face Validity	Concurrent Validity	Construct Validity
Kirton's Adaption-Innovation Inventory (Kirton, 1976, 1987, 1999)	32	1 output <ul style="list-style-type: none"> <li>- Adaption – Innovation</li> </ul> From 3 dimensions <ul style="list-style-type: none"> <li>- Rule governance/conformity</li> <li>- Sufficiency of originality</li> <li>- Efficiency of operation</li> </ul>	Manager samples Student samples International samples (Bobic et al., 1999) Young adult samples (KAI Centre)	Inter-Item n = 808 $\alpha = .88$ (KAI Centre)	Supervisor ratings Task ratings (Bobic et al., 1999)	Leadership practices (Isaksen et al., 2003) Scholarly creativity (M.-Z. Wang et al., 2017)	Belbin's (1993) Team Role Self-Perception Inventory (Aritzeta et al., 2005) Big five personality measures (von Wittich & Antonakis, 2011)
Creative Problem Solving Process Styles (Basadur et al., 1990)	48	4 <ul style="list-style-type: none"> <li>- Experiencing</li> <li>- Thinking</li> <li>- Evaluation</li> <li>- Ideation</li> </ul>	Organisational samples (mix of job roles) (Basadur, 1998)	Inter-Item n = 149 and 107 $\alpha$ range .76 to .83 (Basadur, 1998)  Test-retest (Basadur, 1998)	Self-report Expert ratings (Basadur, 1998)	Preference for divergent thinking (Basadur, 1998)	Kirton KAI (Houtz et al., 2003) MBTI (Basadur, 1998)
Creativity Style Questionnaire-Revised (Kumar et al., 1997)	80	7 <ul style="list-style-type: none"> <li>- Belief in the Unconscious Processes</li> <li>- Use of Techniques</li> <li>- Use of Other People</li> <li>- Final Product Orientation</li> <li>- Superstition</li> <li>- Environmental Control</li> <li>- Use of Senses</li> </ul>	Students (Kumar et al., 1997)	N = 273 $\alpha$ range .45 to .81 (Kumar et al., 1997)	Self-report creative capacity (Lack et al., 2003)	Data not available	Data not available
FourSight (Puccio, 2002)	36	4 <ul style="list-style-type: none"> <li>- Clarifier</li> <li>- Ideator</li> <li>- Developer</li> </ul>	Students (Puccio et al., 2004)	n range 293 to 296 $\alpha$ range .78 to .81	Expert ratings (Puccio, 2002)	Creative Problem Solving (Puccio et al., 2004)	Holland's vocational types (Puccio et al., 2019) Kirton KAI

		- Implementor	Organisational samples (mix of job roles) (Puccio et al., 2019)	(Puccio et al., 2004)			MBTI Basadur's CPSP (Puccio et al., 2004)
me <sup>2</sup> General Factor of Creativity (Irwing & Batey, 2011)	72	4 <ul style="list-style-type: none"> <li>- Idea generation</li> <li>- Personality</li> <li>- Motivation</li> <li>- Confidence</li> </ul>	Mostly highly educated professionals (British Psychological Society, 2013)	n = 2351 $\alpha \geq .68$ $\alpha$ median = .85 (British Psychological Society, 2013)	Data not available	Creative performance (British Psychological Society, 2013)	Mixed findings when compared with other scales (British Psychological Society, 2013)
Brain Storm (SHL)	8	Situational responses	Data not available	Data not available	Data not available	Data not available	OPQ (British Psychological Society, 2003)
My Creative Types (Adobe)	15	8 <ul style="list-style-type: none"> <li>- The Artist</li> <li>- The Thinker</li> <li>- The Adventurer</li> <li>- The Maker</li> <li>- The Producer</li> <li>- The Dreamer</li> <li>- The Innovator</li> <li>- The Visionary</li> </ul>	Data not available	Data not available	Data not available	Data not available	Data not available
Creative ID	40	5 <ul style="list-style-type: none"> <li>- Stimulator</li> <li>- Spotter</li> <li>- Sculptor</li> <li>- Selector</li> <li>- Supporter</li> </ul>	Professionals Multiple industries Managerial samples Cross cultural (Becker, 2009; Johansen, 2011; Rabbetts, 2010)	n = 548 $\alpha$ range .79 to .88 (Johansen, 2011)	Expert ratings (Becker, 2009; Johansen, 2011; Rabbetts, 2010)	Idea generation and idea implementation (Rabbetts, 2010)	Big Five (Becker, 2009) Holland's vocational types (Johansen, 2011)



### **Kirton's Adaption-Innovation Inventory (KAI) (Kirton, 1976, 1987, 1999)**

This tool places individuals on a preference continuum from adaption ('to do things better') to innovation ('to do things differently'). However, although set up as a single continuum, whereby participants with high scores are considered to be 'innovators' and those with low scores considered to be 'adaptors'; it is not set up to measure a single factor – there are three subdimensions which contribute to this overall score. The items in the KAI are grouped into the three factors of: rule governance/conformity, sufficiency of originality and efficiency of operation. High scores in each of these factors would imply that an individual generally breaks rules, proliferates ideas and breaks from established structure – all contributing to a higher overall 'innovator' preference. In contrast low scores would imply conformity to rules, a focus on quality ideas (over quantity) and a structured approach – all contributing to an overall 'adaptor' preference.

This tool was developed by identifying items based on the observational experience of the researcher, amended by the independent views of team managers (i.e. face validity via expert raters) and refined through factor analyses and removing items that skewed the distribution of results to arrive at the 32 item test (Kirton, 1976). Comparing the tool items from their conception (Kirton, 1976) to the latest version attainable (Bagozzi & Foxall, 1995) it can be seen that just six items have undergone minor wording changes in this time, with the remaining 26 identical to the original publication 19 years before. It is not known whether additional versions or iterations have been released since this date – although the tool is the most prevalently used in the literature, access to the full measure is only available to certified KAI practitioners – a lengthy and expensive process. This option was deemed to not be viable for the current research and therefore access to the latest version (should this be different from the 1995 version) has not been available for review. Furthermore, copyright rules restrict the use of the tool for research purposes therefore, this measure could not form part of the research presented in this thesis.

Participants respond to each item of the KAI on a 5-point Likert scale to indicate how easy or difficult they would find it to personally maintain such behaviours. Items in relation to rule governance/conformity include: '*Never acts without proper authority*' and '*Works without deviation in a prescribed way*'. Items in relation to sufficiency of originality include: '*Will always think of something*' and '*Has original ideas*'. Items in relation to efficiency of operation include: '*Is methodical and systematic*' and '*Masters all details painstakingly*'. Theoretically, the range of possible scores on the test is from 32 to 160 – though there is no guidance for scores at the extremes of the scale, or around the mid-point. It is unclear which style would be assigned to participants scoring in these

ranges. Factor analyses provide evidence in support of a 3-factor model (Bagozzi & Foxall, 1995; Taylor, 1989), others propose a 4-factor or even 5-factor model (Im & Hu, 2005). In terms of exactly what the KAI measures or predicts, due to the considerable overlap with personality traits, it is unclear whether it adds additional explanatory value beyond established personality measures in predicting creative performance (von Wittich & Antonakis, 2011) and it has been suggested the KAI be termed a measure of decision making style, rather than creative style (Kozhevnikov, 2007).

This begs the question of what exactly does the KAI measure or predict? Bobic et al. (1999) found that KAI scores were a useful foundation for building diverse, effective teams and it has been proposed that the KAI can impact upon organisational performance via knowledge management preferences, though this remains to be empirically tested (Bloodgood & Chilton, 2012; Chilton & Bloodgood, 2010). Isaksen et al. (2003) found moderate positive correlations between the KAI and some elements of the Leadership Practices Inventory (Kouzes & Posner, 1994; 1997) implying that those with a preference for innovation attain higher scores in relation to desirable leadership practices (correlations of .58 with Challenging the Process; .42 with Inspiring a Shared Vision). However, despite the previously mentioned correlations and relationships, a significant criticism of the KAI is that it does not explain any variance beyond the 'Big five' personality measures. Von Wittich and Antonakis's (2011) review states that the KAI can be largely predicted by personality and gender – cautioning future researchers to always control for personality when using the KAI tool.

### **Basadur's Creative Problem Solving Process (CPSP) Styles (Basadur et al., 1990)**

This adopts a different format to most measures - consisting of 12 sets of four words, with participants asked to assign weightings to the words (from 1 to 4) in each set to reflect how the words resonate with them. Each of the words relates to one of the four dimensions of the tool: Experiencing, Thinking, Evaluation, Ideation (Basadur, 1998). Item sets include: '*Alert, Poised, Ready, Eager*' and '*Patient, Diligent, Forceful, Prepared*'. A possible limitation of this design is that the wording only addresses problem solving activity, not idea generation, implementation, or other behaviours relevant to creativity and innovation. It could therefore be said that it is too limited to be considered a comprehensive measure of creative style. The development of the tool followed a process of identifying relevant items and establishing a level of face validity with 20 business students, before constructing a scoring system across the four dimensions which 'plots' responses visually to suggest where an individual's preference lies on a four-quadrant diagram.

For a forced choice (ipsative) tool, 12 measures in a scale is low, with at least 30 recommended to obtain reliability levels comparable to normative tools (Baron, 1996). Possibly in recognition of this, Basadur (1998) converted the tool to a non-ipsative scale to assess the reliability and validity of the tool, the outcomes of which are stated in Table 2.4. There is no discoverable published research on the reliability and validity of the tool in its original forced choice format; however, in terms of changeability over time, through the administration of the tool during creativity training sessions, the authors note that scores generally remain stable over time, and any changes can be “explained by such factors as job changes that require different thinking and problem-solving modes.” (Basadur, 1998, p33)

### **FourSight (Puccio, 2002)**

This is a 36 item measure using a 10-point Likert scale. The scale is labelled at one end ‘not like me at all’ a middle label of ‘like me’ to the other extreme of ‘very much like me’. The participant receives a separate score on four distinct styles: Clarifier, Ideator, Developer and Implementor (FourSight, 2011). Items include:

- Clarifier – *‘I like to focus on creating a precisely stated problem’*
- Ideator – *‘I enjoy working on ill-defined, novel problems’*
- Developer – *‘I like to generate all the pluses and minuses of a potential solution’*
- Implementor – *‘I really enjoy implementing an idea’*

The development of this tool involved creating 87 statements which were assessed independently for relevance by six graduate students which reduced the number of items to 64 used in a forced rank format. A period of development followed whereby eight different versions of the Foursight tool have been produced through an iterative process – this process involved changing the scoring system to a Likert scale and assessing the factor loadings and reliability of the scale, before making changes (adding/removing items) accordingly based on the findings and retesting with a new participant sample (Puccio, 2002).

Puccio et al.’s (2004) analysis found that when participants take the FourSight profile as well as rating their experience of creative problem solving tasks, expected results were achieved, where those scoring higher on the more divergent elements of FourSight also enjoyed the more divergent tasks. A recent study has shown links between the FourSight styles and vocations which you would typically expect them to be aligned to (i.e the Clarifier and the accounting industry), as defined by Holland’s vocational types (Puccio et al., 2019).

This tool is also unusual in the research in that it does ground itself in established psychological theory – namely Osborn’s (1979) process of Creative Problem Solving (CPS). However, as previously mentioned (section 2.1.3) this model is focused specifically on the development of successful creativity training, and as such its measure of success has been determined by training ratings and performance on generic idea generation tasks, rather than outcome innovation, or other measurable beneficial outcomes in an applicable business context. As such, no discoverable research has been found assessing whether the creative styles as measured by the FourSight tool correlate with, or predict performance, at the differing stages of creativity and innovation as outlined in the CPS or other models. This aside, the structure and breadth of this tool and the associated styles make it the most detailed and theoretically sound measure discovered in the literature search.

### **The Creativity Style Questionnaire-Revised (Kumar et al., 1997)**

This is a longer instrument than most at 80 items addressing seven dimensions, namely; Belief in the Unconscious Processes, Use of Techniques, Use of Other People, Final Product Orientation, Superstition, Environmental Control and Use of Senses. It could be considered that this tool has some limitations; one dimension has only one item (use of senses), and others are arguably difficult factors to quantify scientifically such as ‘superstition’. The stated reliability figures are relatively low compared to other tools (Kumar et al., 1997) – validity information and a full item list, are not currently obtainable.

### **Commercially available tools**

#### **Me<sup>2</sup>**

The me<sup>2</sup> tool (Irwing & Batey, 2011) which, given the experience and positions of the authors (University academics with experience of psychometric tools) would be expected to have a substantial level of theoretical grounding and scientific rigour in its development. The tool is comprised of 4 factors: idea generation, personality, motivation and confidence; each of which is broken down into 2-4 subfactors or facets. The total test has 72 scored items measured on a Likert scale, with a composite score provided to represent a ‘general factor of creativity’. Although at first glance the tool is presented as “a self-report questionnaire designed to assess a person’s preferred style of thinking, feeling and behaving in relation to creativity” (British Psychological Society, 2013), which would place it clearly within the realms of creative style in terms of the definition of the current research - upon closer inspection, the material refers to creativity as an individual or team ‘capacity’ and something which can be trained and developed. This language, which strongly refers to creativity as an ability, along with the outcome factor of creativity as a measure of how creative somebody is for

their own self-awareness and development, leads the reader to believe that this tool, though clearly rigorous and well structured in its pursuit of reliability and validity (British Psychological Society, 2013) is more of a measure of ability, than of working preference. Due to the commercial nature of the tool, the specific items and factor structure are not publicly available for review and therefore this critique has been conducted largely based upon the independent review provided by the British Psychological Society, as well as limited marketing information in the public domain.

### **Brain Storm**

SHL's only psychometric test of creativity – Brain Storm – is also commercial in nature and therefore has limited information available publicly. This tool uses participant's responses to fictional scenarios to determine their level of problem solving ability (SHL, 2021), again this is deemed to be more a measure of ability than preference or style.

### **My Creative Type**

Adobe's creative style measure, My Creative Type, consists of just 16 questions across eight dimensions – although it claims to be “based on psychology”, currently, reliability and validity data, as well as the underlying psychological theory/mechanisms to support this are unavailable (Adobe, 2021).

#### **2.2.5. Creative ID (style measure used in this thesis)**

As touched upon in the previous section, Creative ID is the chosen measure of creative style for the current research. The reasons behind choosing this tool are firstly, that the creators of the tool are funding the current research; and secondly, as will be described through this section of the thesis, it is believed that the Creative ID addresses a number of the shortcomings or development areas associated with other existing measures of creative style. Namely that the tool is more detailed in that it measures five different creative styles, that it accounts for creative and innovative behaviour beyond idea generation alone, that the tool is aligned to established and respected creativity and innovation theory, and finally that the different creative styles identified by the tool are expected to have relationships to performance at differing stages of the creativity/innovation process. All of which lends itself to addressing some of the gaps in our current knowledge around creativity, innovation and creative style; whilst also having potential to add to existing theory and a contribution to practical application.

The Creative ID was initially developed in 2004 by industry experts in creativity and innovation, including; Hanne Kristiansen (Head of European Innovation at Kellogg's, Head of Ideation for UK/Europe and Innovation Marketing Manager UK/US at Diageo) and Pippa Hodge (?What If! Innovation consultancy). The tool was developed as a method of identifying behaviours in the creativity and innovation process of innovation teams. From the observation of behaviour in an organisational setting alongside knowledge of the creativity and innovation process, six constructs were identified: Stimulator, Spotter, Selector, Sculptor, Supporter and Spoiler – with the sixth construct, Spoiler, subsequently removed due to poor fit when considered in terms of the innovation process. In a similar development process to the KAI, practical observational experience and expert ratings produced the initial items alongside pilot sessions delivered to innovation teams in both the UK and USA for feedback and development of face validity.

From 2009, the tool was further developed with Prof Kamal Birdi at the University of Sheffield, (workplace creativity and training expert, senior lecturer in Occupational Psychology, and Chartered Occupational Psychologist) to ensure there was adequate scientific rigour behind the development of this tool as a psychometric, with three versions of the tool (to date) tested for reliability and validity through a series of research projects. All versions of the tool have been measured using a 6-point Likert scale with possible item responses ranging from 'strongly disagree' to 'strongly agree'. Version 1 of the tool (in 2009) consisted of 50 items which were considered by the creators to encompass all required behaviours of interest in terms of creative styles present in the workplace.

The five Creative ID constructs are briefly defined below, with *Table 2.5* illustrating how these relate to various stages of innovative work behaviour processes.

- The Stimulator – stimulating refers to generating streams of new and challenging ideas; a divergent & disruptive style. e.g. "Ideas are always popping into my head."
- The Spotter – spotting refers to combining pieces of information, or seeing patterns and connections, to identify potentially beneficial opportunities; an abstract and intuitive style. e.g. "I can easily combine seemingly unrelated pieces of information to generate a new idea."
- The Sculptor – sculpting refers to developing and building upon existing ideas, making complex things simple, tangible and concrete. e.g. "I take the lead in making ideas tangible and concrete."
- The Selector – selecting refers to thinking convergently in evaluating options and making logical decisions when problem solving, setting context and focusing on an end goal. e.g. "I can list the pros and cons of an idea easily."

- The Supporter – supporting refers to encouraging, offer guidance and otherwise get the best performance from others; empowering, collaborative and fostering an environment for growth. e.g. “I offer support and guidance when a team member hits a barrier on a project.”

The five creative styles (Stimulator, Spotter, Sculptor, Selector, Supporter) were identified as distinct styles which the tool aimed to measure, with 10 items generated per identified style. It is now recognised that this first version of the tool could be considered quite exploratory, and that if the process of developing the tool were to start again from scratch, the five creative styles would be much more specific in their definitions, and the subsequent creation of items would therefore be far more focused and systematic in ensuring that they intended to comprehensively measure each style as defined. This first version of the tool was used as part of an MSc research project conducted by Becker (2009) which explored the relationship between creative style, creative performance and time pressure – the aim of this research was to firstly assess the reliability and validity of the Creative ID tool before exploring the relationship between creative style and creative performance whilst considering the impact of supervisor support and time pressure. The research was conducted using online survey responses from 165 participants from two organisations – one a global mobile communications company, the other a UK based news media organisation. In terms of the Creative ID tool itself, this 50-item tool was proposed to measure five distinct creative styles, however, Becker found that following exploratory factor analysis the tool was reduced to a 21-item tool across four factors for research purposes (factor loadings  $>.4$ ;  $\alpha$  range .63 to .80), with the fifth ‘Sculptor’ creative style not clearly identified and therefore being removed. The research concluded that the creative styles measured (using Creative ID version 1) positively correlated with creative performance, though no significant moderating or mediating effects of time pressure were found. Supervisor support was expected to account for additional variance in creative performance beyond that which was accounted for by creative styles, though this hypothesis was not supported. Following this research, Creative Creatures was given advice and guidance by Prof. Birdi and the MSc student researcher regarding which items could be revised in the creation of a second version of the tool – this guidance was provided with the aim of both improving the reliability and factor structure of the model from a statistical viewpoint, but also ensuring that the items proposing to measure each of the five creative styles better aligned to the working definitions of those styles.

Version 2 of the tool (in 2010) was again a 50-item tool, with 10 items measuring each of the five creative styles. Just 9 of the 50 items included in this tool were retained with identical wording from Version 1. As with Version 1, when it came to assessing the tool as part of an MSc research project

conducted by the author of this current thesis (Rabbetts, 2010), exploratory factor analysis was utilised and the tool was subsequently reduced to 25 items – which were made up of five items for each of the five creative styles (factor loadings  $>.4$ ;  $\alpha$  range .678 to .857). This second MSc study set out to explore the potential barriers to creative performance at the individual (creative self-efficacy, creative intrinsic motivation), interpersonal (workplace incivility) and organisational levels (training, tolerance of failure, support for risk taking, time pressure, autonomy). The research was conducted using online survey responses from 610 participants from the marketing, innovation, and research and development functions of three large multinational organisations. This research found positive correlations between creative styles and creative performance, whilst all referenced potential ‘blockers’ to creativity were found to have significant relationships with idea generation performance, idea implementation performance, or both (Rabbetts, 2010). Further guidance was provided to Creative Creatures based on this research to assist with the development of the next version of the Creative ID tool.

Version 3 of the tool (in 2011) retained the same structure, with 50 items in total measuring five creative styles (10 items per style). 22 items in this tool were retained from Version 2. Exploratory factor analysis was used to assess Version 3 of the tool, again as part of an MSc project conducted by Johansen (2011). This analysis found that after the removal of 10 items, a five-factor structure could be established for the remaining 40 items – however, only two of these factors aligned with the proposed creative styles (Stimulator and Supporter), with the remaining three factors involving cross-loadings and items loading onto ‘wrong’ factors in relation to the proposed Spotter, Sculptor and Selector creative styles. This third MSc study which incorporated the Creative ID tool set out to firstly validate the tool, before exploring creative styles alongside Holland’s vocational job types to assess whether job characteristic preferences related to creative preferences. The research was conducted using a time-separated design comprised of two time points, 12 months apart – 147 participants from nine multinational organisations participated with the research finding expected correlations between creative styles and job types (i.e. a creative style preferring to come up with new ideas positively correlating with ‘artistic’ job types), though this must be considered within the context of the questionable factor structure of the tool. Despite the multiple timepoint structure of the study, this research did not look at the stability or changeability of individual creative style over time. Again, recommendations were made to Creative Creatures regarding the future development of the tool – with the specific advice to remove all negatively worded items as these were all found to be ‘weaker’ in the analysis.



This brings us to the present and most recent version of the tool – Version 4. As has been outlined, each subsequent version of the tool was produced through an iterative process – this process involved assessing the factor loadings and reliability of the scale, before making changes (adding/removing items) accordingly based on the findings and retesting with a new participant sample. The fourth version, the latest and most updated, is the version used in the current research presented in this thesis. The tool consists of 40 items across five creative styles, 22 of these items were retained from version 3, whilst a further 13 were items that had been reworded from previous iterations of the tool, with 5 new items being created from scratch – all with the aim of regaining the clearer factor structure obtained in versions prior to version 3. It is proposed that the five styles do not sit on a continuum, they are distinct from each other with participants receiving a graphical output of their preferences after taking the tool – with some individuals producing a more ‘rounded’ outcome across the five styles, or alternatively a clear preference ‘spike’ in just one or two of the styles. The items are worded as statements of how an individual would usually go about their work i.e. ‘I tend to open up new avenues for thinking rather than closing things down’, each scored on a 6-point Likert scale (completely disagree, mostly disagree, slightly disagree, slightly agree, mostly agree, completely agree). All items are measured on a 6-point scale which means that there is no central or ‘neutral’ response option available to participants – the creators of the measure were of the opinion that a central ‘neutral’ option could be made redundant and that participants should be able to agree or disagree to some extent with each item in the measure. Following further iteration and amendment to the Creative ID tool as recommended by the findings of the third Masters study, the most recent analysis conducted (Birdi, 2012) concluded that the current version of the tool (Version 4, used in the research presented in this thesis) has strong values for internal reliability, with alpha values between .79 and .88 for each of the five factors.

It is at this stage that the current research, and researcher, becomes actively involved in the Creative ID tool and its ongoing development – recognising that in order to better establish the robustness of the current version of the tool, additional analyses and theoretical considerations are required beyond those previously considered in MSc research projects. Going beyond exploratory factor analysis in terms of looking at the reliability and factor structure of the tool (research methodology and justification outlined in section 4.2) will provide a more rigorous assessment of the tool; it is also important to better ground the tool in relevant existing theory in order to explore levels of construct and criterion validity, whilst making any findings more generalisable across the wider field of creativity and innovation. As outlined in Chapter 1, the owner of Creative ID, Creative Creatures, is sponsoring the research and one of the key aims and outcomes of this project is to explore the robustness of the

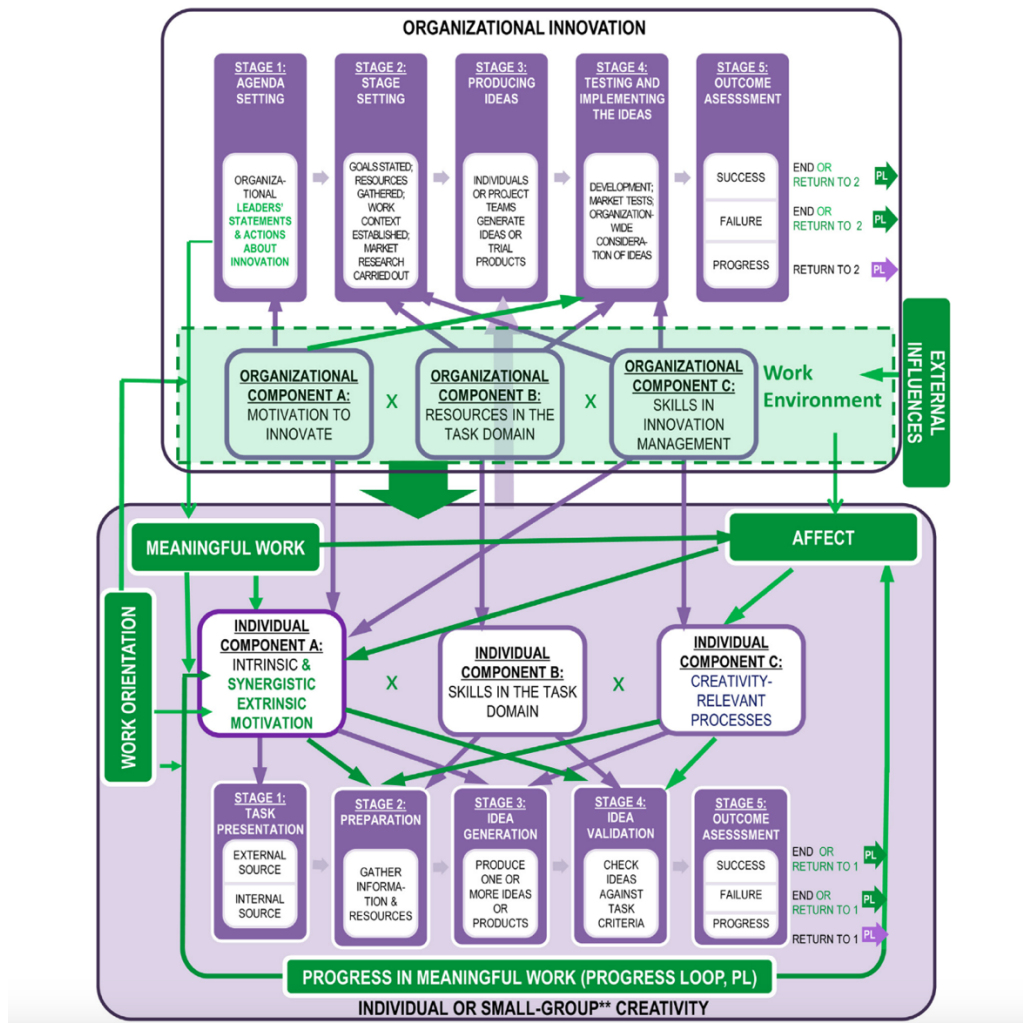
latest version of the Creative ID tool following the most recent MSc level research – this brought about the requirement to embark upon the research with a fixed instrument, to test it as it currently is, utilising the years of data collected on this version (detailed in section 4.2.2) before making any further suggestions or amendments in relation to the development of the tool.

The Creative ID covers a range of behaviours relevant to the creativity and innovation process and since its creation as a bottom-up measure born in industry, can be aligned to established theories of individual innovative behaviour. In the Componential Theory (Amabile, 1988, 2012) and Dynamic Componential Theory (Amabile & Pratt, 2016), the identified stages of individual or small group creativity are: task presentation, preparation, idea generation, idea validation and outcome assessment – the key skills/tasks relevant to each of these stages is listed in Table 2.5. It is important to note that the model “applies to both high and low levels of creativity” and that all stages of this model are considered “...necessary, and no one component is sufficient for creativity in and of itself” (Amabile, 1988, p. 139). This is consistent with the basis of the Creative ID whereby creative style is positioned as the preference of an individual in achieving creativity at any level, rather than a direct measure of creative achievement or output. It is also stated in the Dynamic Componential Theory that creativity related processes (such as thinking patterns, behavioural preferences, etc.) are required at multiple stages of the process – this is also consistent with the Creative ID styles which relate to multiple stages of the creativity/innovation process. When the stages of the creativity/innovation process are discussed throughout this thesis, this refers to the stages of the individual creative process as outlined in Amabile’s Componential Theory and further updated in the Dynamic Componential Theory. Specifically, the five stages in the theory are:

1. Task Presentation – involves identifying the specific goal to be achieved or problem to be solved. This can be triggered by an external source (such as an organisational requirement) or from internal motivation to solve a certain problem.
2. Preparation – involves preparing for success. This involves gathering the required resources, information and skills required to tackle the chosen problem.
3. Idea Generation – involves coming up with ideas to solve the problem. Greater relevant skills at this stage are expected to contribute to a higher quantity of ideas produced as well as a higher level of novelty.
4. Idea Implementation – involves evaluating the ideas produced. This involves checking the ideas against the task criteria, specifically in terms of usefulness and appropriateness.
5. Outcome Assessment – involves assessing the results of previous stages. This involves objective assessment and implementing a feedback loop of reflective learning where,

depending upon an outcome of success or failure, there may be a return to revisit previous stages as appropriate.

Figure 2.3 - The Dynamic Componential Theory of Creativity and Innovation taken directly from Amabile and Pratt (2016, p. 165)



The Dynamic Componential Model (outlined in Figure 2.3) proposes that creativity relevant processes have an impact on Stages 2-4 of individual or small-group creativity, namely; preparation, idea generation and idea validation. Therefore, through these proposed relationships, these three stages of creativity/innovation can be deemed relevant to creative style (as creative style has a strong overlap, definitionally, with creativity related processes). This leaves both Stage 1 and Stage 5; Stage 1 (Task Presentation) is theorised to be impacted by the motivation of the individual, whilst Stage 5 (Outcome Assessment) does not have any specific predictors identified in the model, it is simply seen as the final necessary stage of the creative/innovative process to determine whether the outcome has been a success, a failure, or whether a previous stage needs to be revisited to improve or alter the

outcome in some way. For the purposes of the current research, all five stages of the creative/innovative process will be considered – with Stage 1 being included as relevant to creative style due to the overlap between an individual’s motivation (as theorised in the model) and what an individual prefers to do (which, in the pursuit of creative/innovative output, could be described as their creative style preference). Amabile et al. (1994) echo this sentiment of preferences being aligned to motivation in their measure of working preference which is designed solely to determine the intrinsic and extrinsic motivations of an individual. Based on the definitions and theoretical underpinning of the current research, it would be expected that creative style be related to individual motivation, though, in contrast to Amabile’s working preference tool, these constructs would not be considered as one and the same. Creative style as it is defined in this thesis, identifies the preferences of an individual for how they prefer to be creative, including different modes, approaches and patterns of behaviour. Although there would undoubtedly be an element of motivation included in creative style, the current definition also allows for practical working methods, approaches and behaviours which go beyond the underlying factors of motivation. In terms of Stage 5 (Outcome Assessment), although not linked to other constructs in the model, the definition provided has strong links to decision making and assessing quality against an established standard – this, it could be argued, also has relevance to creative style as a working preference in the pursuit of creativity which involves strategic thinking, attention to detail and making decisions based on logical, objective data. For these reasons, all five stages of the creative/innovative process are deemed relevant to creative style and shall therefore be included throughout this thesis and the associated research when referring to creative/innovative performance.

In relating this to creative style and the Creative ID measure in particular, Table 2.5 illustrates the definitions of the five stages of the creativity/innovation process, as well as the most relevant of the five creative styles (as measured by the Creative ID) to each stage of the creative/innovative process. The areas of bold text denote where there is overlap between the definitions and therefore indicates that the particular creative style is deemed relevant at that specific stage. It is acknowledged that the Sculptor creative style – that which is associated with building on the ideas of others – is expected to overlap with idea generation due to this preference for finding new ways of progressing existing ideas; however, this creative style is not expected to be the one *most* relevant to the creative/innovative stage of idea generation above that of the Stimulator creative style.

*Table 2.6 – Creativity and Innovation process and the Creative ID constructs*

Amabile (1983,1988), Amabile & Pratt (2016) Stages	Key skills/tasks/milestones (from Amabile & Pratt, 2016)	Creative ID construct most relevant for this stage	Creative ID construct definition ( <b>bold</b> denotes areas of overlap with the Amabile/Amabile & Pratt stages)
1. Task Presentation	Identifying the goal to be attained / problem to be solved Motivation to solve problems	Selector	thinking convergently in evaluating options and <b>making logical decisions when problem solving</b> , setting context and <b>focusing on an end goal</b>
2. Preparation	Building knowledge, skills and relevant information Gathering resources Task relevant skills	Spotter	<b>combining pieces of information, or seeing patterns and connections, to identify potentially beneficial opportunities</b> ; an abstract and intuitive style
3. Idea Generation	Producing ideas Motivation to generate ideas	Stimulator	<b>generating streams of new and challenging ideas</b> ; a divergent & disruptive style
4. Idea Validation	Assessing ideas against criteria Determine usefulness and appropriateness of ideas Task relevant skills	Selector	Thinking convergently in <b>evaluating options and making logical decisions</b> when problem solving, <b>setting context</b> and focusing on an end goal
5. Outcome Assessment	Assessment and evaluation Decision making Feedback	Selector	Thinking convergently in <b>evaluating options and making logical decisions</b> when problem solving, <b>setting context</b> and <b>focusing on an end goal</b>

Given the links to innovation process theory, the Creative ID is more closely aligned in its theoretical grounding to other creative style measures such as FourSight which could also relate to several stages of the innovation process. These tools are in contrast to the KAI which only covers ‘adapting’ and ‘innovating’, with no indication of the theoretical underpinning of the tool and how it was decided that adapting and innovating should sit at opposing ends of a continuum. The Supporter creative style may not logically fit as obviously in the Amabile theory – however, given the Supporter’s preference to motivate others, this may still have impact at the task presentation and idea generation stages which Amabile highlights are stages where motivation plays a key role. Additionally, alternative theories of innovation processes highlight more explicitly the role of a ‘Supporter-like’ role focusing on personal interaction and relationship building, such as Kanter’s (1988) coalition building stage and Janssen’s (2000) idea promotion stage – both of which would fit between stages 3 and 4 of Amabile’s theory in the process. Furthermore, Amabile & Pratt recognise leadership influence in their creativity relevant processes which are seen to impact Stages 2-4 (preparation, idea generation, idea validation) and therefore the leadership nature of the Supporter creative style may still impact performance at these stages. More of the relationship between creative style and leadership is discussed in the appropriate section (2.4.4).

Creative ID has been shown to have significant correlations with the expected Big five personality traits (e.g. the Stimulator with Openness, the Supporter with Agreeableness (Becker, 2009). This makes logical sense for the expected typical behaviours associated with the styles and differs from the previously discussed correlations between the KAI and Big Five personality measures – the KAI outcome is significantly positively correlated with extraversion and openness, as well as being significantly negatively correlated with conscientiousness, agreeableness and neuroticism to the extent that von Wittich and Antonakis (2011) found that 67% of the variance in responses on the KAI could be accounted for by personality measures alone, therefore implying that the KAI is so heavily aligned to the Big Five that it is unclear to what extent it can measure anything meaningful beyond the personality measure. In contrast, similar analyses conducted by Becker (2009) found that personality measures alone accounted for a between 19-56% of responses relating to each individual creative style (the highest percentage relating to the Supporter style), with 33% of the responses across a composite measure of creative style being accounted for by personality traits as measured by the big five.

#### **2.2.6. Research Question 1**

As has been highlighted throughout this chapter, there are a number of gaps and relatively under-researched areas in the literature regarding creative style that could be, in some way, addressed through the development of a research question and tested through appropriate hypotheses.

Firstly, in terms of practical significance, it has been highlighted that the existing measures of creative style have limitations which could be addressed through the development of a more in-depth, robust tool which explores a wider range of creative styles. Additionally, the existing measures of creative style are not aligned to a broad creativity/innovation theory such as the Dynamic Componential Theory, with many not obtaining correlations or predictive validity in relation to creative performance. Furthermore, in the existing published research, existing measures of creative style have not explained any variance in job outcomes beyond that explained by personality measures.

Secondly, at a theoretical level, further knowledge of creative style – its measurement, antecedents, and relationships, could build upon our existing understanding of creative theories (by incorporating individual preferences more explicitly) and theories of innovation by clarifying which creative styles (and therefore which individuals) best ‘fit’ and add most value to each stage of an innovation process. To clarify, the position of the current research is in alignment with Kirton in the belief that there are no bad creative styles. However, there is a discrepancy in the literature regarding whether creative

styles have any correlation with creative performance, or whether style and performance should be considered entirely separate from each other. This is something that the current research is ideally positioned to explore – not whether there is a ‘best’ style for creative performance (because, as we’ve seen in the Amabile, and Amabile and Pratt theories, creative performance is not a single action of idea generation but is achieved through a number of distinct stages); but whether there are certain creative styles which have a stronger positive relationship with performance at particular stages of the creativity/innovation process than others.

The KAI has been the most prolifically utilised creative style tool for over 40 years, and it may be time to consider an alternative option. Despite its popularity, there is debate regarding the underlying factor structure as well as ambiguity around scoring at the extremities and mid-point. Additionally, despite studies validating the tool, there is a strong line of criticism stating that the KAI is too closely aligned to the big five personality measures to provide any original explanation of job outcomes. Furthermore, there is no stated theoretical basis to which the KAI sits on. Creative ID matches up to, and in certain aspects may exceed the current range of tools available in terms of detail, reliability and validity as well as being grounded in established creativity and innovation process theory. This tool has been selected to be the focus of the current research, to assess the tool against the standards of the existing measures and explore whether a creative style tool can contribute more to the explanation of job outcomes than personality measures alone.

This critique of the literature resulted in the creation of the first research question addressed by the research presented in this thesis:

***Research Question 1: How robust is the Creative ID measure of creative style, and to what extent can creative style explain variance in performance at different stages of creative/innovative process beyond that which can be accounted for by Big Five Personality Domains alone?***

In addressing Research Question 1, specific research hypotheses were developed and will be outlined in detail in the relevant study chapters to follow (chapter 4.1)

### **2.2.7. Section Summary**

This chapter clarified the working definition used throughout the research in this thesis in relation to creative style, before adding further clarification to the definition by explicitly stating what creative style does not refer to. Next, as creative style is not explicitly mentioned in the current theories of

creativity and innovation, it was identified where this construct would logically fit in order to provide a meaningful theoretical contribution to the literature. The existing methods of measuring creative style were outlined and critiqued, before providing an overview of the measure assessed and implemented in the current research – the Creative ID. Finally, based on the preceding analysis of the literature and creative style measures, Research Question 1 was introduced.

### **2.3. Development of Research Question 2: Changeability of creative style over time**

When considering creative style, and the benefits that better understanding this construct can bring to individuals and organisations, it is important to understand whether an individual's creative style changes over time. Firstly, at a theoretical level, should creative style be relatively fixed over time, further research can be conducted to determine whether creative style correlates, or even is caused by, other trait-like constructs such as personality. On the other hand if creative style is found to be more changeable, further research can look into whether there are correlations with other state-like constructs such as motivation, and also into which contexts and events could contribute to a change in an individual's creative style. Furthermore, this understanding of nature over time will better enable creative style as a construct to be more accurately placed in the Dynamic Componential Theory – either being more closely aligned to the creativity relevant processes which include traits, or more closely aligned to intrinsic motivation which can (as will be discussed on this section) be relatively stable or changeable over time. Secondly, at a practical level, if creative style is deemed to be more fixed over time this could have implications for job-role fit, recruitment and developing diverse teams safe in the knowledge that the people being assigned to certain tasks, roles or teams are unlikely to change in their creative preferences over time. Alternatively, should creative style be considered more changeable over time, there may be an opportunity (once the drivers or influences on such a change are better understood) to either plan for changes accordingly in the workplace if these are influenced by factors such as age or experience; or training interventions could be developed to bring about desired changes in an individual's creative style to better help them fit a certain role, position or team. This chapter focuses on the nature of creative style, specifically in terms of how/if an individual's creative style changes over time i.e. whether it is more state-like or more trait-like in terms of its observed changeability. Additionally, should an individual's creative style be expected to change over time, what contexts or experiences could contribute to such a change? This section aims to illustrate five points about the existing literature on states and traits, as well as the relevance and applicability of this literature to the topic of creative style:

1. To clarify what is meant by the terms state and trait, both in terms of accepted definitions, and by highlighting constructs which are accepted as being trait-like or state-like.



2. To explore whether the literature considers creativity to be more trait-like or state-like.
3. To highlight that little research has been conducted into the state or trait-like nature of creative style; that this is a gap in the literature and scientific knowledge.
4. To touch upon personality as a comparable construct which has been seen to remain stable over time, yet change in certain circumstances.
5. To introduce Research Question 2.

### **2.3.1. Defining states and traits**

Fridhandler's (1986) conceptual article aimed to clarify the four elements which contribute to the state-trait distinction – the first of these being temporal duration – whether something is a short-term state or long-term trait. However, in using the example of a person's mood, far more information is required to determine a state or trait. If somebody is angry for a day, or two days, or a week... at what point does this become long term enough to determine whether this individual is simply in a bad mood which will pass (state), or if they are indeed an angry person in general (a trait)? The second determinant of state versus trait is whether the characteristic is interruptible or not. When a characteristic is uninterruptible or continuous, it is thought to be more state-like – people do not simply snap out of a bad mood momentarily and then revert back to it, it runs its course and then the state passes. On the other hand, a trait could be seen to be interruptible or reactive - an angry person will not be angry 100% of the time, an especially joyful event could interrupt this. This terminology may seem counter-intuitive, logic would tell us that a state could be interrupted and a trait would be continuous. However, a similarity can be drawn here between climate and weather – a country with a hot climate is generally hot over a period of time, though this can be interrupted, just like a trait. Whereas a thunderstorm is an example of weather, it is something state-like which lasts a certain amount of time without interruption before passing and then allowing the general status (the climate/trait) to resume. The third area is around concrete versus abstract entities. A state is thought to be something more concrete which can be immediately felt in the moment; whereas a trait is not able to be determined on a single point of reference, but rather something more abstract that is inferred over multiple timepoints and experiences. Finally, there is the issue of situational causality versus personality causality – where something more state-like is influenced by situational factors, and something more trait-like would be caused by personality. Chaplin et al. (1988) note that traits allow you to predict the present based on past behaviour, with states allowing for the identification of behaviours which can be controlled by manipulating a situation.

In defining states and traits it is unclear whether these are seen as mutually exclusive characteristics, although states (things which are changeable), and traits (things which are stable) seem to be opposites, there appears to be intermediary positions where the construct in question is referred to as 'more state-like' or 'more trait-like'. This implies that there is a threshold somewhere in the middle of this supposed state-trait continuum which is highlighted by Chen et al (2000) who, when looking at predictors of learning performance, distinguish between constructs such as general self-efficacy (trait-like) and specific task-related self-efficacy (state-like). Both are measures of an individual's self-reported belief in their ability – but one focuses on the 'general' which does not change over time, while the other focuses on the 'specific' and can be context dependent. What is not clear is where exactly to draw this line between trait and state. Additionally, motivation is said to sit on a trait-state continuum (Kawagoe et al., 2020) with the more trait-like construct determining whether people are generally 'motivated' individuals; and the state-like construct indicating an individual's current level of motivation in relation to a task at hand. Again, there is no clear boundary between the two.

To clarify, a state-like construct could be defined as something which is changeable over time, yet uninterrupted in the short term - a concrete experience likely brought about through identifiable situational factors and can be controlled by manipulating a situation. In contrast a trait-like construct could be defined as a long-term situation which can be interrupted at times before reverting back, making it relatively unchangeable over time – it is a largely abstract entity which cannot be determined upon a single point of reference and is likely a part of, or linked to, personality allowing you to predict the present based on past behaviour.

### **2.3.2. The changeability of creativity and creative style**

This brings us to the third main point of this chapter, that there is a gap in the existing literature, and therefore our understanding, in relation to whether creative style is more state-like or more trait-like in terms of its changeability over time.

Kirton's KAI (1976, 1987, 1999) is currently the dominant measure of creative style and as such you would expect this measure to form the basis of much of the previous research into whether creative style is relatively fixed or stable over time. Currently, there has been no discoverable research into this area, either in relation to the KAI, or the other existing measures of creative style discussed in this thesis (section 2.2.4). Peterson et al. (2009) note that cognitive and behavioural styles are thought to be partly fixed and relatively stable over time, however this is an inconclusive finding and further investigation and clarification around definitions would need to be done to establish exactly where

creative style fits within the bounds of cognitive/behavioural styles. Whereas von Wittich and Antonakis (2011) give a much bolder conclusion that creative style adds nothing beyond established measures of personality, and could therefore be assumed to be synonymous with measures of personality and as such would have the same supposed trait-like characteristic. As there is no posited theory, or empirical evidence put forward to clarify the nature of creative style over time, this leaves the current research with no solid theoretical grounding from which to build testable hypotheses. By taking a step back from the construct of creative style to the wider field of creativity, could this provide some more definitive theoretical grounding from which to build a testable model?

As previously discussed, there is a significant differentiation to be made between creativity and creative style, although they are inherently linked as both are concerned with the pursuit of creativity in the workplace – creativity (as defined in this thesis) refers to the outcome, whereas creative style is the individual preferences and patterns in behaviour for achieving creative outcomes. The majority of research into creativity focuses on creativity as an outcome – as a measure of performance in a relevant task such as idea generation. As such, much of this research explores how to maximise or increase creativity, as you would with any desirable performance measure – therefore, as creativity as a performance outcome is generally seen as something which can be manipulated, trained, or improved upon; the mechanisms for achieving said outcomes would best fit with our accepted definition of something which is state-like and changeable over time – that can be brought about through identifiable situational factors and controlled by manipulating a situation. This stance is supported by the large body of research into the impact of creativity training on creative performance (e.g. Birdi, 2016, 2021; Phelan & Young, 2003; Scott et al., 2004; Weiss, 2001) – purposefully manipulating a context to enable an improved level of the outcome measure. An enhanced state of creativity is also referenced in work on children playing video games (Crombie et al., 2016; Moffat et al., 2017) and in neuroscientific research, the specific areas of the brain that ‘switch on’ during creative activity have been identified (Green et al., 2012, 2015, 2017; Tempest & Radel, 2019; Weinberger et al., 2016).

Alternatively, we could consider creativity to be trait-like and relatively unchangeable over time. It feels logical that some people are simply more creative than others and always will be due to some inherent trait or mechanism - looking at the accepted definition of a construct that is more trait-like, we see that this would be something that is likely a part of, or linked to, personality allowing you to predict the present based on past behaviour. By this definition, we find many research findings imply that creativity is more trait-like due to significant relationships with personality traits. A meta-analysis

of the research into creativity and personality established significant relationships between creativity and a number of the big five personality traits and such relationships have also been found to be consistent over time (Feist, 1998). Evidence for a relationship between personality traits and creativity has been further supported by more recent research (Batey et al., 2009, 2010; Hughes et al., 2013; Raja & Johns, 2010; Zare & Flinchbaugh, 2019) and the same has been shown with the general factor of personality (Rodriguez et al., 2020; van der Linden et al., 2016), though Runco (2004) notes that these correlation relationships do not explain the specific mechanism by which personality impacts creativity and this could be mediated by intrinsic motivation (Amabile, 1983; Amabile & Pratt, 2016; Prabhu et al., 2008). Batey et al. (2009) found significant relationships between levels of creativity, specifically divergent thinking, with two of the big five personality traits and also intelligence – the relationship between creativity and intelligence has also been reported by Benedek et al. (2014), with Karwowski et al. (2016) going as far as to question whether creativity is possible at all without intelligence; therefore forging another strong link between creativity and a recognised trait.

Overall, this brings us to the conclusion that there is no definitive stance on whether creativity is state-like or trait-like - as previously discussed in this thesis, the majority of research treats creativity as an outcome – a performance measure to be increased, thus implying that it can change over time and is not an inherent trait, yet the volume of research linking creativity to personality contradicts this. Theoretically, this could place creativity among constructs such as motivation and self-efficacy; whereby individuals could be seen as more/less creative in a general trait-like way (which links back to the research on creative personality and ability in section 2.2.2), whilst others could be seen as having context-related creativity levels which could be trained or manipulated over time. Therefore, with this level of uncertainty around the nature of creativity, and this being the field within which we are positioning the main focus of this thesis and the presented research – creative style – this gives us little concrete theoretical grounding with which to state whether creative style would need to be more trait-like or more state-like to ‘fit’ the dominant theories in this area of the literature.

### **2.3.3. Finding a precedent for construct changeability over time**

There is no discoverable research into whether the creative style of an individual is changeable over time, and furthermore the research on the wider field of creativity is also inconclusive on this point. This poses a problem when constructing research with a positivist philosophical stance in that there is a requirement to base your research upon a foundation of what is already ‘known’, before using existing data to make reasoned and logical hypotheses regarding what you predict to happen in your own research. Given that there is no specific precedent for determining the stability of an individual’s

creative style over time, the research presented in this thesis looked to establish a logical comparison from which to start the required theoretical assumptions. In this thesis, it has been decided to address this in two ways: firstly, by considering a more established construct which has been researched in similar ways; and secondly by considering an alternative field of research which has developed in a similar fashion.

Through addressing the limited research in the field, we can see that the construct most closely and consistently associated with creative style is personality (Batey et al., 2009, 2010; Cheng et al., 2010; Gelade, 2002; George & Zhou, 2001; Hughes et al., 2013; Raja & Johns, 2010; Wang et al., 2017) - with some researchers claiming that creative style is actually just a subset of personality (von Wittich & Antonakis, 2011) which would bring it in line with the definition of creative personality. However, as discussed in the section on what creative style is not (section 2.2.2), the position of the current research is that there is enough variation between the definitions of the constructs (and a lack of empirical evidence stating similarities between the two) to warrant further research into creative style in its own right, to further understand where these constructs differ. However, the fact that creative style has been aligned to personality traits in the literature provides the strongest possible basis we currently have available from which to build a research question and subsequent testable hypotheses in line with our positivist research philosophy. Personality has long been considered to be a trait i.e. something which is stable over time (Costa et al., 2019; Costa & McCrae, 1985; McCrae & Costa, 1997), though recent research has identified instances where certain contexts and experiences have been seen to precede significant changes in personality as measured by the Big Five – examples include the experience of unemployment (Boyce et al., 2015), workplace stress (Smallfield & Kluemper, 2021), levels of job control/demands (Wu, 2016), the long term experience of job insecurity (Wu et al., 2020); as well as more general life ‘transitions’ including entering the world of work, beginning a relationship, starting university (Leikas & Salmela-Aro, 2015) or simply reaching older age (Debast et al., 2014).

Additionally, the case has been made previously (section 2.2.3) that there is a parallel between the fields of creativity and leadership in that the trajectory of research interests mirror each other. There was first a strong focus on leadership as an output, to later focusing more heavily on individual leadership styles and their relevance to the wider study of leadership across varying contexts. It can be said that creativity research is following this same journey of development, from focusing heavily on creativity as an output, to now opening up the opportunity for more research into an individual’s creative style and the associated implications. Research in this leadership area shows that leadership styles – such as; transformational, transactional and authentic – are also related to personality traits

(Bono & Judge, 2004; de Vries, 2012; Shahzad et al., 2020; Tierney et al., 1999), something found to be true for creative style. This makes possible relationships between creative style(s) and leadership style(s) logical due to the nature of the construct being a preferred way of working, there being relationships with personality traits (Becker, 2009), and thought to relate to creative/innovative performance (Rabbetts, 2010). In terms of drawing conclusions in relation to the nature of creative style over time, should this be similar to that of leadership style(s) it would be considered relatively stable over time, though could change due to contextual variables such as organisational features, colleague characteristics (Sun et al., 2017) and specific, targeted training interventions (Brown & May, 2010).

Taking into account the associated construct of personality and the 'similar' research field of leadership style when looking to find an established basis for hypothesising about the nature of creative style over time, we can see that the common theme coming through is that in these areas, individuals are generally seen to think/behave/act/lead in a way that is largely consistent over time, though can be seen to change subject to certain conditions, contexts or experiences.

#### **2.3.4. The impact of work-life experiences on 'traits' over time**

Extrapolating from the research into personality, it has already been discussed that factors seen to contribute to a change in personality traits over time include; unemployment, workplace stress, levels of job control and long term job insecurity. Each of these, as well additional work-life experiences, namely; promotion to a leadership position, changing organisation/team/location and the experience of parental leave will be discussed. Firstly, in terms of what the literature tells us about how these experiences can contribute to changes in an individual over time, and how these findings could relate to creative style.

The first group of work-life experiences to address – unemployment, workplace stress, low levels of job control and long term job insecurity – have been grouped together due to the negative nature of the experiences, as well as the lower level of predictability regarding such events. None of these experiences would be something people would generally want to experience and due to the unexpected or non-planned nature of them they are termed 'non-normative' and have predominantly been associated with an increase in neuroticism over time. Through research into the effect of these experiences on personality, we can see that those subject to unemployment over an extended period (four years) experienced significant changes in agreeableness, conscientiousness and openness compared to those who remained employed or were reemployed within three years, with these

groups experiencing limited to no change in personality traits (Boyce et al., 2015). Additionally, one study found increased job stress over a five year period was found to correlate with a significant increase in neuroticism and significant decrease in extraversion (Wu, 2016), whilst a similar study found an increase in neuroticism and decrease in both agreeableness and conscientiousness in those who experienced chronic job insecurity over a four to nine year period (Wu et al., 2020). The onset of chronic disease in young people (aged 20 to 23) has also been seen to coincide with an increase in neuroticism (Leikas & Salmela-Aro, 2015). Finally, Smallfield and Kluepfer's (2021) theoretical paper takes into account empirical findings across the field and also considers how physiological responses of an individual to workplace stressors could impact upon their personality traits both in the short and long term. A brief summary of the theory posits that experiencing workplace stressors at the individual, team or organisational level can trigger a cognitive threat or challenge response – this in turn has a physiological impact on brain activity and neurotransmitter which go on to (in the case of increased serotonin for example) have a positive correlation with conscientiousness and agreeableness, and a negative correlation with neuroticism. Further empirical research is required to establish support for the model.

Other factors seen to be associated with a change in personality traits over time can be considered more positive experiences, also ones which are more expected or easier to plan for and considered 'normative' or simply 'life transitions'. These include aging, entering the world of work, beginning a relationship and starting university. The experience of these work-life events have been shown to correlate with, or predict, a change in personality in terms of an increase in conscientiousness (Leikas & Salmela-Aro, 2015); whilst Debast et al's review article looking into the literature on personality traits over time from 1980-2012 found that in general, neuroticism, extraversion and openness tend to decrease after the age of 60, with agreeableness and conscientiousness increasing after the same age (Debast et al., 2014) though this is contested by Costa et al. who claim that changes over time are not due to age but measurement error, use of alternate measures or self-report inconsistencies (Costa et al., 2019).

Other work-life experiences of interest to the current research include the experiences of promotion to a leadership position, experience of creativity training, moving company and the experience of parental leave. In terms of leadership, although there is no discoverable research into the relationship between an individual's leadership status and their creative style, promotion to a leadership position brings about a new focus and set of responsibilities (Maak & Pless, 2006) which could impact upon their creative style (i.e. their own preferred way of achieving creativity) as the need to focus more on

others increases (George & McLean, 2007). It could be proposed that the added responsibility and focus on others could result in an increased preference for creative styles which prefer to support the success of others (such as the Supporter creative style as measured by the Creative ID). There is a great depth of research into the impact of creativity training on individuals in relation to their subsequent performance in related creative activities (Birdi, 2016; Phelan & Young, 2003; Puccio et al., 2004; Scott et al., 2004), though no discoverable research into whether the experience of creativity training leads to a change in creative style or personality. Logically, an improvement in creative ability relating to one or more stages of the creativity/innovation process could correlate with a change in the preferred creative style utilised by an individual to better align with their newly increased abilities. Although there is no discoverable research into the relationship between experiencing parental leave and creative style, or indeed personality, again, it could be proposed that the added caregiver responsibility and expectation of support associated with parenting could increase a preference for creative styles which support the success of others and emphasise harmony with others (such as the Supporter creative style as measured by the Creative ID). Firstly, due to more supportive people generally being more agreeable (Branje et al., 2005); secondly, that the agreeable personality trait is linked to the Supporter creative style (Becker, 2009); and finally, that people have been seen to rate their agreeableness as even higher in a work context than at home (Donahue & Harary, 1998).

The relevance of this chapter to the current research is, based on the available evidence and logical assumption, that an individual's creative style behaves in a similar way to personality traits in that it is relatively stable over time, yet can change given the experience of certain work-life events. In terms of the negative experiences discussed (unemployment etc.), where a change in personality trait has been observed, this has occurred after experiencing such a work-life event for a number of years – it is acknowledged that in conducting the current research, such a lengthy timeframe was unachievable and therefore the time-separated study design is much shorter in this instance. Implications and justification for this chosen methodology are discussed in detail in the relevant study chapter (chapters 4) and discussion chapter (chapter 6). In terms of the more positive work-life experiences, again, the previous research referenced in this chapter which demonstrated change over time was generally conducted over a period of three years or more; though it is unclear how quickly the personality traits were believed to have changed in these cases following the experience of key events such as starting a relationship or starting university.



### **2.3.5. Research Question 2**

The theme of this chapter has been to highlight that there are either inconsistencies in the existing literature (in relation to the state-like or trait-like nature of creativity) or a lack of research altogether (in relation to the state-like or trait-like nature of creative style) in the key areas of which this thesis and research are interested in. Therefore, in order to construct a meaningful research question, and subsequent testable hypotheses, it is not possible to rely solely on established empirical research as the basis for research predictions – but to also incorporate knowledge of alternative areas of research, logical inference and practical observed experience.

The current literature on change in personality traits highlights that it is predominantly the experience of negative events which have preceded a change in a personality trait or traits over time, and these have been routed in work-life experiences (such as unemployment, workplace stress etc.) rather than negative life events beyond the workplace (such as bereavement, divorce etc.). A further area of interest in terms of work-life experiences is that of promotion to a leadership position – although there is no current research into the relationship between an individual's leadership status or style and their creative style, promotion to a leadership position brings about a new focus and set of responsibilities (Maak & Pless, 2006) which could impact upon their creative style (i.e. their own preferred way of achieving creativity) as the need to focus more on others increases (George & McLean, 2007).

This brings us to the second of our research questions which focuses on 'change' in terms of establishing whether creative style changes through concrete experience likely brought about through identifiable situational factors:

***Research Question 2: Is an individual's creative style changeable over time, and which work-life events could contribute to a change?***

In addressing Research Question 2, specific research hypotheses were developed and will be outlined in detail in the relevant study chapters to follow (chapter 4).

### **2.3.6. Summary**

This chapter highlighted five key areas in relation to creative style and its nature over time. First, in clarifying what is meant by the terms state and trait, both in terms of accepted definitions, and by highlighting constructs which are accepted as being trait-like or state-like. Second, in demonstrating that there is no definitive consensus over whether creativity is seen as state-like or trait-like. Third, in

highlighting that no discoverable research has been conducted into the state-like or trait-like nature of creative style and this is a gap in the literature and scientific knowledge worth addressing. Fourth, in touching upon personality as a comparable ‘trait’, and leadership as a comparable field of study, a potential theoretical grounding for research into creative style over time has been established. Finally, based on the literature available to date, Research Question 2 was introduced which will form the basis for specific hypothesis development (outlined in chapter 4).

#### **2.4. Development of Research Question 3: Relationships between creative style and leadership style**

The section introduces another area of interest to this thesis and the associated research – leadership. As highlighted in Chapter 1, the decision to include leadership and leadership style in the current research was made for two main reasons – firstly that leaders themselves are required to be creative and innovative in their roles, and secondly due to the way in which they influence the creativity and innovation of others. It has been discussed in previous chapters that the development of the leadership literature over time mirrors that of creativity in that historically the research focus was on an outcome measurement and performance, with more recent developments moving into exploring individual styles. There is a vast body of research linking leadership and follower creativity, including links between leadership style and established enablers and barriers to creative performance. Additionally, leader-level factors have been acknowledged as creativity relevant processes, and therefore factors which are theorised to influence individual creativity and innovation in the Dynamic Componential Theory (Amabile & Pratt, 2016). However, there is very little research on creative style and leadership, or leadership style; what the implications could be for the performance of followers of a leader with a particular creative style; or how an individual’s creative style may change over time due to leadership responsibility.

Specifically, this chapter aims to illustrate the following points:

1. To define what is meant by leadership and leadership style in an organisational context.
2. To review the existing measures of leadership style.
3. To explore the relationships between leadership style and follower creative/innovative performance.
4. To touch upon any existing literature concerning creative style and leadership style.
5. To introduce Research Question 3.

#### **2.4.1. Defining leadership and leadership style**

Leadership is a vast area of academic research worthy of an entire thesis in itself – however, the main focus of this thesis and the associated research is creative style. Therefore, when we discuss leadership and leadership style throughout this thesis, they are not covered in the same level of detail and rigour afforded to the work on creative style. What this thesis aims to do is to address the gap in our existing knowledge relating to creative style – how it behaves over time and its relationships with other constructs. The majority of the previous literature on creative style, including that covered in the literature review (section 2.2) has a focus on the individual – assessing the creative style of an individual and what that means in terms of relationships with other factors and constructs at the individual level. However, the workplace and the pursuit of creativity should not (always) be considered an individual endeavour – working with others is common, especially as an individual achieves leadership responsibility. This highlights a gap in the literature and our existing knowledge regarding how an individual's creative style may impact upon others in the workplace in terms of how their performance is influenced by the creative style of their leader. One construct of interest to the current research is leadership style – with this construct being potentially impactful at both the individual level in terms of how an individual's leadership style related to their own creative style, but also at the interpersonal level in terms of how a leader's creative style relates to the creative/innovative performance of their followers.

In addressing leadership style, it is therefore appropriate to outline what is meant by this term, how it is measured, and the relevance to this thesis; though it is not considered to be the main focal point of this thesis, and as such, the literature review concerning it is not as extensive. It is important to establish the rationale for studying a potential relationship between creative style and leadership style, as it is recognised that these two constructs do not immediately have a logical link. Firstly, there is a link in terms of predicting creative performance, as previously discussed, there is debate in the literature regarding whether creative style and creative performance are related, or should even be considered to be - this is an inconsistency the current research is looking to address. There is less debate over the link between leadership style and performance – the following chapter will outline the empirical findings linking certain leadership styles to increased workplace performance (e.g. Tierney, 2008), with some of these findings specifically concerning creative/innovative outcomes (e.g. Bono & Judge, 2003; Dong et al., 2017; Gong et al., 2009; Ma & Jiang, 2018; Rosing et al., 2011; Shin & Zhou, 2003). This is the first argument for researching both creative style and leadership style – if both can be linked to increased creative/innovative performance, it would be interesting to better understand any potential relationships between the two, or any mediating or moderating effects one

may have on the other's relationship with performance. Secondly, as this chapter will cover in greater detail, we are currently unaware of exactly what predicts leadership styles which are seen to be beneficial for workplace performance – furthermore, Koh et al., (2019) has noted that there is currently no discoverable research into the “innovativeness” of transformational leaders – meaning that we are also unaware of the creative styles/preferences of those who are considered to have certain leadership styles, as well as the creative ability they demonstrate themselves. The current research is ideally placed to investigate both of these points – the possible relationship between two predictors of creative performance, and the unknown “innovativeness” of certain sought after leadership styles. Such knowledge and understanding would contribute towards our wider understanding of how people prefer to be creative and how people prefer to lead others – all in the context of achieving beneficial creative and innovative outcomes for individuals and organisations.

In defining leadership in an organisational context, we find that “After decades of dissonance, leadership scholars agree on one thing: They can't come up with a common definition for leadership.” (Northouse, 2016, p. 5). It has been said that the number of definitions of leadership is almost equal to the number of researchers in the field, and this may be due in part to the ever-evolving nature of leadership in an organisational context and ‘trends’ of what is seen to be ‘good’ leadership. Rost (1991) noted 221 definitions of leadership in the literature, from this extensive review he noted four key elements to a definition of leadership, specifically that leadership involves; (1) a relationship based on influence, (2) referencing leaders and followers, (3) who intend on real change, and (4) develop mutual purposes. Based on this heavily summarised analysis, Rost's chosen definition is that:

*“Leadership is an influence relationship among leaders and followers who intend real changes that reflect their mutual purposes.” (1991, pp. 102–103).*

Leadership style refers to the different styles in which an individual behaves as a leader, with the intention of achieving ‘leadership’ as defined above – they can be described as:

*“patterns of informal and interactive behaviors that are believed to foster certain desirable or undesirable follower-, team-, or organization related objectives or consequences” (Fischer & Sitkin, 2023, p. 332).*

There are clear parallels between this definition of leadership style and our working definition of creative style: Creative styles are individual preferences, modes or approaches in which people prefer

to be creative – that is, in their attempts to develop and introduce new and improved ways of doing things which result in potential benefits. Both definitions of style refer to preferences and patterns in an individual's behaviour which impact upon outcomes in creativity or leadership respectively. It is important to note that there are a wide variety of leadership styles referenced in the literature, some associated with positive leadership outcomes, others associated with negative leadership outcomes – and, unlike personality which has the 'Big Five', there is no single 'go-to' theory or measure of leadership style which is accepted as appropriate across contexts by the majority of those working in the field. In contrast, transformational, transactional, servant, authentic and ambidextrous leadership styles (among many others) are all prevalent in the literature with advocates of each (covered in more detail in section 2.4.2). In fact, at the time of writing, all major theories and measures of leadership style have been subject to heavy criticism which will be discussed in greater detail in the next section of this chapter. This issue of measurement, however, does nothing to alter the accepted definition of leadership style outlined above which will be adopted throughout this thesis.

#### **2.4.2. Measuring leadership and leadership style**

The predominant way of determining good leadership through the ages has been through subjective measures of the leader to better establish which traits, behaviours and ways of interacting with others converge to define differing 'leadership styles' which are seen to predict success. In terms of a trait approach to leadership, as we have seen from the state/trait discussion on creativity, the 'go-to' measure of trait in psychology is regularly the 'Big Five' or five factor model of personality (Costa & McCrae, 1985; Goldberg, 1990). In a meta-analysis of 21 years of research into personality and leadership, Judge et al. (2002) concluded that, with the exception of agreeableness, all of the Big Five traits have significant correlations with positive leadership outcomes (positive correlations with openness to experience, conscientiousness and extraversion; negative correlation with neuroticism). However, it is difficult to interpret how or why this is the case, and the authors imply that the traits are "useful", but not essential for, a prediction of leadership. This finding is supported by another meta-analysis from Bono and Judge (2004) who concluded that although extraversion was significantly correlated with positive leadership behaviour, they call for more specific personality measurements when researching leadership as the Big Five may be too broad a tool to really discover the personality antecedents of desirable leadership outcomes. In summary, although there is evidence for certain traits correlating with leadership performance, there is no consensus on a definitive list of traits possessed by 'good leaders' and the concept of 'good' leadership is largely subjective.

An alternative to the trait approach to leadership is a behavioural approach, this approach focuses more on the actual behaviour displayed to determine an individual's leadership style or preference and this is where we address the measurement of leadership style. In short, this approach is more about what leaders do, rather than who they are. A number of theories or models aim to address this issue of measuring leadership style – including specific research which has been conducted into how these varying styles of leadership impact upon follower performance. These are detailed in the work of Hughes et al., (2018) and Lee et al., (2020) among others and include; transformational and transactional leadership (Bass & Riggio, 2006); servant leadership (Spears & Lawrence, 2002), authentic leadership (Walumbwa et al., 2008) and ambidextrous leadership (Rosing et al., 2011). The key elements of each of these theories is outlined in Table 2.6.

*Table 2.7 – Theories and models of leadership*

Theory/Model	Definition of leadership	Features/concepts/elements
Transformational and transactional leadership (Bass & Riggio, 2006)	<p>Transformational:            “Transformational leadership entails establishing oneself as a role model by gaining followers’ trust and confidence. Transformational leaders state future goals, develop plans to achieve those goals, and innovate, even when their organization is generally successful. By mentoring and empowering followers, such leaders help followers to develop their potential and thus to contribute more effectively to their organization.” (Eagly &amp; Carli, 2003, p. 815)</p> <p>Transactional:            “[Transactional leaders] appeal to subordinates’ self-interest by establishing exchange relationships with them. Transactional leadership involves managing in the conventional sense of clarifying subordinates’ responsibilities, rewarding them for meeting objectives, and correcting them for failing to meet objectives.” (Eagly &amp; Carli, 2003, p. 815)</p>	<p>As measured by the Multifactor Leadership Questionnaire (MLQ) (Bass &amp; Avolio, 1997)</p> <p>Idealized Influence (II): Leaders become role models who are trusted, admired and respected.</p> <p>Inspirational Motivation (IM): Leaders are motivational, inspirational and portray enthusiasm and optimism.</p> <p>Intellectual Stimulation (IS): Leaders stimulate their followers by challenging them to use new approaches to old situations.</p> <p>Individualized Consideration (IC): Leaders become coaches and mentors, paying attention to each follower individually.</p> <p>As measured by the Transformational Leadership Scale (Rafferty &amp; Griffin, 2004):</p> <p>Vision: “The expression of an idealized picture of the future based around organizational values.” (an alternative to Idealized influence in the MLQ)</p> <p>Inspirational communication: “The expression of positive and encouraging messages about the organization, and statements that</p>

		<p>build motivation and confidence.” (an alternative to inspirational motivation in the MLQ)</p> <p>Intellectual stimulation: “Enhancing employees’ interest in, and awareness of problems, and increasing their ability to think about problems in new ways” (retained factor from MLQ)</p> <p>Supportive leadership: “Expressing concern for followers and taking account of their individual needs.” (an alternative to individualized consideration in the MLQ)</p> <p>Personal recognition: “The provision of rewards such as praise and acknowledgement of effort for achievement of specified goals.” (an alternative to contingent reward which, in the MLQ, is a factor of transactional leadership though Rafferty and Griffin state this aligns to transformational)</p>
Servant Leadership (Spears & Lawrence, 2002)	<p>“Servant leadership is not rooted in a quest for power, fame, or any self-centered goal... [A servant leader] listens well and feels the human condition. Servant leaders are concerned with the least privileged in society and strive to help others grow as persons. Servant leaders want to help those they serve become healthier, wiser, freer, more autonomous, and more likely themselves to become leaders.” (Giampetro-Meyer et al., 1998, p. 1734)</p>	<p>10 characteristics (Spears &amp; Lawrence, 2002)</p> <p>Listening</p> <p>Empathy</p> <p>Healing</p> <p>Awareness</p> <p>Persuasion</p> <p>Conceptualisation</p> <p>Foresight</p> <p>Stewardship</p> <p>Commitment to the growth of people</p> <p>Building community</p>
Authentic Leadership (Walumbwa et al., 2008)	<p>“Authentic leaders... know themselves, act in accord with their true selves, and express themselves in ways that are consistent with inner thoughts and feelings” (Hsiung, 2012, p. 350)</p>	<p>4 dimensions (Walumbwa et al., 2008)</p> <p>Self-awareness: Understanding of the world, awareness of own strengths and limitations, awareness of how others see them and how they can have an impact on others.</p> <p>Balanced Processing: Are objective and analyse data thoroughly before coming to a decision and solicits their views</p>

		<p>may challenge deeply help positions.</p> <p>Internalised Moral Perspective: Are highly moral and their actions and behaviours are guided by their own moral beliefs.</p> <p>Relational Transparency: Presentation of an authentic self – they are open to others and openly share opinions and express true thoughts and feelings, setting a platform therefore for followers to openly share their own ideas without fear.</p>
Ambidextrous Leadership (Rosing et al., 2011)	<p>“The requirement of ambidexterity in the innovation process implies that individuals working in an innovation context need to both explore and exploit, and switch between those two activities. Therefore, an effective leader of an innovative workforce needs to foster both exploration and exploitation, and has to be capable of flexibly switching between both.” (Rosing et al., 2011, p. 966)</p>	<p>3 elements (Rosing et al., 2011)</p> <p>Opening leader behaviours: to encourage followers to engage in exploration.</p> <p>Closing leader behaviours: to encourage followers to engage in exploitation.</p> <p>Temporal flexibility: to switch between both of the above as required in the current situation.</p>

In terms of conducting a meaningful review of the literature concerning leadership style, the theories themselves will not be critiqued in great detail in terms of their theoretical grounding and development – the focus will be more on determining which of these styles is most appropriate and relevant for creativity and innovation research in an organisational context. Drawing upon recent comprehensive reviews of the leadership style literature – namely, Hughes et al. (2018), Lee et al. (2020) and Fischer and Sitkin (2023) – it is clear that transformational leadership has the greatest prevalence in the field, with 427 papers meeting the inclusion criteria set by Fischer and Sitkin, compared with the next most ‘popular’ desirable leadership style being authentic leadership with 91 references. Similarly, Hughes et al. found 75 papers on transformational leadership to meet their criteria (with Leader-Member Exchange (LMX) next with 40), and Lee et al. including 179 identified relationships between transformational leadership and creativity and/or innovation (followed by LMX with 126) in their paper. Additionally, these papers all note that transformational leadership is consistently related to higher levels of both creativity and innovation in followers; though it should be noted that so are many others – Hughes et al. note that out of 13 leadership styles included in their research, 12 were found to be beneficial for creativity (with the exception being transactional leadership). This has led to experts in the area (Hughes et al., 2018; Fischer & Sitkin, 2023) to propose



that the abundance of positive leadership styles currently measured actually makes it more difficult to determine which are the strongest predictors of creativity and/or innovation. There may be a significant shift in the coming years in terms of the way in which positive leadership style(s) is measured, to ensure that positive behaviours are measured, not simply positive sentiment or attitude. However, in the absence of such developments, and given that the scope of this thesis is not broad enough to develop a new measure of leadership style, the current thesis will utilise what is currently available, accessible and comparatively well regarded in the leadership style field.

In order to provide the soundest possible grounding for the current research to make a meaningful contribution to the creativity and innovation literature, the method of measuring leadership style with the greatest body of research – and the most common leadership style investigated in terms of predicting creativity – will be utilised, and the methods of measuring transformational leadership will be addressed to determine their suitability and relevance to the current research into creativity, innovation and creative style.

Transformational leadership can be described in terms of the “4 I’s” - idealised influence, inspirational motivation, intellectual stimulation and individualised consideration. In contrast to the 4 I’s, transactional leadership is characterised by contingent reward and management-by-exception. Both of these leadership styles, seen to be mutually exclusive, are measured by the Multifactor Leadership Questionnaire (MLQ) (Bass & Avolio, 1997). It should be noted that there are variations on these transformational subdimensions – the 4 I’s refer specifically to those measured by the MLQ, though alternatively titled and defined subdimensions can be found in the work of Rafferty & Griffin (2004) – each of these are defined in Table 2.6. The MLQ tool has been reviewed and validated by Muenjohn and Armstrong (2008) using confirmatory factor analysis; and a meta-analysis of the transformational leadership literature using the MLQ found it to be reliable and also predictive of work effectiveness (Lowe et al., 1996). Further support comes from research comparing the MLQ with an alternative measure of transformational leadership, The Transformational Leadership Scale (Rafferty & Griffin, 2004) which found the MLQ to be a better predictor of leadership outcome variables in the Estonian military (Kasemaa & Suviste, 2020); it is acknowledged that this is a niche population sample, though comes from one of the few research papers to directly compare two measures of transformational leadership.

Conversely, criticism for the MLQ from Wilson et al. (2020) states that the use of the MLQ in leadership development “perpetuates falsehoods, misrepresentations and inequalities”. However, the authors

of this paper seem to hold the same view of all such psychometric or personality profiling tools, so this could be considered a particular view of psychometric instruments in general, rather than a criticism of the MLQ specifically. Van Knippenberg & Sitkin's (2013) assessment of the MLQ is highly critical, claiming the concept of transformational leadership is poorly defined and measured, lacking the required depth of theoretical background. This view is supported by others (Fischer & Sitkin, 2023; Mhatre & Riggio, 2014) though much of the criticism is for the poorly defined charismatic element which makes up only a part of transformational leadership as measured by the MLQ. Further queries around the psychometric suitability of the measure are raised, with calls for work to be done to either improve the factor structure of the existing MLQ, or use alternative measures (Tejeda et al., 2001) – something which the Transformational Leadership Scale (Rafferty & Griffin, 2004) aims to address. As yet, a universally accepted alternative measure to the MLQ has not emerged to become the new 'go to' tool, though the Transformational Leadership Scale appears to achieve a similar level of psychometric reliability compared to the MLQ in the limited research that has compared the two measures (Kasemaa & Suviste, 2020). Additionally, given that it was designed to be used as a measure of five distinct subdimensions of transformational leadership, rather than a single composite measure, this was chosen to measure leadership style in the research presented in this thesis as it provides the level of granularity of measurement that is deemed appropriate for exploring how different creative styles and leadership style can impact upon differing stages of the creative/innovative process. It is acknowledged that this tool has been found to have lower predictive validity in terms of relevant leadership outcomes than the MLQ (Kasemaa & Suviste, 2020), however, this research explored the prediction of leadership outcomes using the Transformational Leadership Scale as a single-factor measure of transformational leadership behaviour, rather than predicting outcomes using the subdimension scales as measures in their own right as per the intention of the tool. Furthermore, in light of the depth of criticism of the MLQ – that this may also bring into doubt the findings of Kasemaa & Suviste which support the MLQ, and others which claim that the MLQ can predict leadership outcomes reliably, due to the queries surrounding the subdimensions which make up its composite score.

Generally in the published literature, despite both the Transformational Leadership Scale and the MLQ being composed of multiple underlying factors, these are usually combined into a composite score representing transformational leadership as a single construct (Bono & Judge, 2003; Dong et al., 2017; Fischer & Sitkin, 2023; Gong et al., 2009; Ma & Jiang, 2018; Rosing et al., 2011; Shin & Zhou, 2003; van Knippenberg & Sitkin, 2013). However, given the critiques of the MLQ in particular regarding its factor structure and the underlying theory behind how these factors contribute to an overall measure of

transformational leadership (van Knippenberg & Sitkin, 2013), it is also valuable to consider the underlying factors as distinct measures of desirable leadership behaviours in their own right – in terms of the MLQ these underlying factors are; idealised influence, inspirational motivation, intellectual stimulation and individualised consideration. In Rafferty and Griffin's Transformational Leadership Scale, these underlying factors are: vision, inspirational communication, intellectual stimulation, supportive leadership and personal recognition – though in contrast to the general usage of the MLQ, Rafferty and Griffin explicitly state that "it is appropriate to examine the individual leadership subdimensions as opposed to a higher-order transformational leadership factor" (2004, p. 347).

#### **2.4.3. Leadership style and creativity**

Research exploring leadership and creativity is significant, yet heavily one-way, with the focus on the effect of leadership style on creative/innovative performance of their subordinates (Tierney, 2008). The importance of this relationship for organisations is emphasised by Bledow et al. (2009a, 2009b) and Chen et al. (2013) among others in that a transformational leadership style has been found to be beneficial to creativity and idea generation in particular (Bono & Judge, 2003; Dong et al., 2017; Gong et al., 2009; Ma & Jiang, 2018; Rosing et al., 2011; Shin & Zhou, 2003) with mediating factors identified such as a climate for innovation (Wang et al., 2017), level of engagement in the creative process (Henker et al., 2015) and creative self-efficacy (Chaubey et al., 2019; Gong et al., 2009). Whereas Transactional Leadership has been shown to have a negative relationship with idea generation (Tung, 2016) and positive impact on innovation and idea implementation (Pieterse et al., 2009; Rosing et al., 2011). Some contrasting evidence has been found whereby transformational leadership has not been found to be beneficial to creativity such as the work of Ma and Jiang (2018), though this exception to the general consensus was hypothesised by the authors due to their selection of participants (relatively inexperienced Chinese professionals in roles more suited to a transactional approach). Transformational leadership has also been found to correlate with better leadership ratings (in terms of perceived effectiveness) with this holding true for ratings given by supervisors of the leader (Guay, 2013) and from followers/employees of the leader, though this may be moderated by the follower's personality (Bono et al., 2012).

A limitation for the transformational-transactional style is that it may not be as effective for younger working generations i.e. 'Millennials' (Anderson et al., 2017) and the latest thinking is moving towards ambidexterity, whereby individuals who switch effectively between opening leadership behaviours which are seen to be more encouraging of "exploration" and a wider scope of activity, opening up

new avenues, ideas and way of working; and between closing leadership behaviours which focus more on “exploitation” concerning the narrowing of the scope of activity to ensure the adherence to processes and efficiencies. This ability for leaders to switch between the two styles of opening and closing as and when required has been shown to be especially effective in relation to innovation performance (Rosing et al., 2011; Zacher et al., 2016). There are certain parallels to be found between the transformational-transactional and the ambidexterity camps in leadership – whereby a key characteristic of both transformational leadership and opening behaviours being divergent thinking (Bajcar et al., 2015; Jung, 2001); and both transactional leadership and closing behaviours being associated with convergent thinking (Bajcar et al., 2015). However, in other work, these links to divergent and convergent thinking have brought about mixed and non-significant findings, at least in studies involving small groups of students (Sosik et al., 1997, 1999). Much of the ambidexterity research to date has been conducted at an organisational level, rather than at individual leader level (Bledow et al., 2009a) and due to the relative recency of the theory and smaller sample sizes, measurement scales are open to criticism (Zacher & Rosing, 2015).

Throughout the literature, there are existing links between leadership style and the creative performance of their followers with several notable mediator relationships identified. Research has found that a transformational leadership style correlates with higher levels of follower self-efficacy (Liao & Chuang, 2007) as well as self-efficacy mediating the relationship between transformational leadership and higher creative performance of followers (Gong et al., 2009). Similar relationships were found between transformational leadership styles and higher levels of follower intrinsic motivation (Shin & Zhou, 2003; X. H. Wang et al., 2016) though no significant relationship was found by Jaussi & Dionne (2003). Transformational leadership has been found to correlate with higher support for risk taking (Asmawi et al., 2013; Shin & Eom, 2014) and follower autonomy (Basu & Green, 1997; Den Hartog & Belschak, 2012), both of which correlate with higher levels of follower creative performance. Interestingly, in an experimental setting, both transformational and transactional leadership styles have been found to lead to higher levels of follower creative performance, with transformational achieving higher quality ideas, and transactional achieving higher quantity (Herrmann & Felfe, 2014). A meta-analysis of the literature concerning transformational leadership and follower creative performance (Koh et al., 2019) found that there is a positive direct relationship between transformational leadership and follower creative performance, however, once mediators (creative self-efficacy; intrinsic motivation, identification with leader, psychological empowerment, innovation climate) are added in to the analysis, the direct relationship of transformational leadership with follower creative performance becomes negative, with significant positive relationships for all

mediators stated. These mediatory relationships have been found in multiple studies (Afsar et al., 2014; Afsar & Masood, 2018; Gong et al., 2009).

Koh et al. also state that “our up-to-date review did not find studies that evaluated the innovativeness and/or creativity levels of transformational leaders” (2019, p. 641) It would be beneficial to conduct further research into these areas to clarify the relationship between leadership style and these constructs - specifically in a creative context whilst exploring the role of creative style and building upon existing creativity and innovation theory. This is a gap that the current research is well positioned to explore.

The comprehensive review papers in this area by Hughes et al. (2018) and Lee et al. (2020) note that empowering and authentic leadership styles are actually seen to have a slightly stronger relationship than transformational leadership when considering the creativity and innovation performance of followers. Empowering leadership is seen to have a correlation range of 0.20-0.66 or a corrected population correlation of 0.44 with self-rated creativity of followers; Authentic leadership has a range of 0.01-0.75 or corrected population correlation of 0.48; with Transformational Leadership as a whole seen to have a lower range of -0.13-0.68 and lower corrected population correlation of 0.36 (Hughes et al., 2018; Lee et al., 2020). However, these authors also seem to generally agree with the sentiment of Fischer & Sitkin (2023) who note that there is a broader measurement issue with leadership style as a whole, in that various measures of ‘different’ leadership styles are so closely correlated and have similar predictive validity to the extent that they could possibly all be tapping into the same underlying construct relating to ‘good’ leadership. Specifically, they note that 12 of 13 leadership styles analysed (with transformational being the exception) all correlate positively with creative and innovative outcomes.

#### **2.4.4. Leadership style and creative style**

There is a lack of research on the relationship between creative style and leadership style – when searching the existing literature for the terms “creative style” and “leadership style” or “transformational leadership” or “transactional leadership”, only three results are returned. Of these three studies all are concerned with a “creative style of leadership” and are solely about leadership style, not creative style in the sense discussed throughout this thesis (Nielsen et al., 2008; Nielsen & Munir, 2009; Piaw & Ting, 2014). Therefore, no discoverable research has been identified which explicitly looks into the relationship between leadership style and creative style. Having a greater understanding of this would be valuable – not just in stereotypically ‘creative’ roles, but with

implications for; recruitment, selecting an appropriate leader for particular projects, or selecting an appropriate leader in terms of the make-up of the team they are leading. Training interventions based on this knowledge could further enhance the self-awareness of individuals in how their creative and leadership styles are linked, highlighting and developing the skills to interact with (and lead those) with differing styles.

There are two key areas of research to distinguish between – the individual level, and the leader-follower level. At the individual level it would be interesting to see whether there are correlations between creative style and leadership style, as there is currently a lack of understanding regarding the antecedents of desirable leadership styles such as transformational leadership (Sun et al., 2017); of which creative style could be one. Although there is currently no research evidence on this specific relationship, it is proposed that the creative style of an individual could potentially be an antecedent to desirable leadership style primarily due to the chronological nature of how and when such styles develop within an individual. An antecedent to any leadership style would, by definition, have to be something which was present in an individual before their leadership style was formed – this has led to research exploring whether factors such as personality traits could be such an antecedent (e.g. Judge et al., 2002; de Vries, 2012). Using this same logic, it is proposed that an individual's creative style – the individual cognitive or behavioural modes or approaches to work – would be developed relatively early in an individual's career once they join the working world and develop tendencies for certain working modes or approaches. It is generally later in an individual's career that they are promoted into leadership positions formally, or at least find themselves responsible for others in the workplace in a more informal arrangement – therefore chronologically, when the leadership style of an individual is formed, it is likely that their creative style (alongside other existing traits and preferences such as personality) has already been formed for some time, and therefore could inform how an individual then chooses or prefers to lead others.

At the leader-follower level of research it would be interesting to take this theoretical relationship between creative style and leadership style further by exploring the creative performance of followers. Leadership style (transformational in particular) has been seen to impact the creative performance of the leader's direct reports (Bono & Judge, 2003; Dong et al., 2017; Gong et al., 2009; Ma & Jiang, 2018; Rosing et al., 2011; Shin & Zhou, 2003) and to some extent it has also been shown that creative style correlates with creative performance (Becker, 2009; Johansen, 2011; Puccio et al., 2004; Rabbetts, 2010; Wang et al., 2017) – therefore, if it can be theorised that creative style predicts leadership style, and both creative style and leadership style predict follower creative/innovative

performance, it could also be theorised that leadership style is the mechanism through which a leader's creative style impacts upon their followers' performance in a positive mediation relationship. To clarify, there are three identified gaps in the literature here:

- Relationships between creative style and leadership style at an individual level.
- Whether a leader's leadership could be influenced by their creative style.
- Whether leadership style mediates a positive relationship between creative style and follower creative performance.

#### **2.4.5. Research Question 3**

As Koh et al., (2019) noted, there is currently no discoverable research into the "innovativeness" of transformational leaders – meaning that we are currently unaware of firstly, what exactly predicts transformational leadership styles; and secondly, the creative styles/preferences and abilities of those who are considered to have a transformational leadership style. The current research is not only well placed to address this in terms of a relationship between leadership style and creative performance, but also to take this a step further in exploring not just 'how much' creativity certain leadership styles are seen to achieve, but also how they prefer to do so in clarifying their creative style. Furthermore, Sun et al.'s (2017) review into the antecedents of transformational leadership categorises the suspected antecedents of this desirable leadership style as (1) the leader's qualities (including traits), (2) context factors, and (3) the leader's colleagues' characteristics. The present research is well placed to look at point (1) in this regard as it can be explored whether creative style is a potential antecedent to transformational leadership. Furthermore, the current research can explore the relationship between leader and follower, taking into account the leader's creative style when looking at follower creative/innovative performance. Studies in this area of research "...are rare, an area that warrants future research." (Sun et al., 2017, p. 20).

This brings us to Research Question 3:

***Does an individual's creative style relate to their leadership style, and how do these styles at the leader level relate to follower creative/innovative performance?***

#### **2.4.6. Summary**

This section highlighted four key areas in relation to leadership, leadership style and their relation to creativity and creative style. First, in clarifying what is meant by the terms leadership and leadership style in an organisational context. Second, in reviewing the existing measures of leadership style and

coming to the conclusion that there are numerous measures, yet none are universally considered adequate. Third, in demonstrating that there is significant research into the effect of leadership style on creative performance, yet no discoverable research into leadership style and creative style. Finally, based on the literature available to date, Research Question 3 was introduced which will form the basis for specific hypothesis development (section 5.2).

## **2.5. Overall Summary**

Firstly, a review of the dominant theories of creativity and innovation highlighted that creative style simply does not feature in the established theoretical literature. However, the Componential Theory (Amabile, 1983, 1988) more recently updated as the Dynamic Componential Theory (Amabile & Pratt, 2016) provides the most logical theoretical ‘home’ for creative style as it encompasses creativity relevant processes and both creative and innovative outcomes.

Secondly, a definition of creative style was confirmed, with a review of the existing measures of creative style provided. The measure of creative style to be used in the current research, the Creative ID, was introduced and the benchmarks established in this section for the reliability and validity of a measure of creative style will be referred back to.

Thirdly, it was highlighted that we currently have no knowledge regarding the nature or changeability of an individual’s creative style over time – parallels were made to the literature on personality traits and possible implications of creative style being more, or less, changeable were discussed.

Finally, leadership style was introduced as an additional construct to add further knowledge to our understanding of creative style. This is due to the fact that the development of research over time for leadership style closely mirrors that of creative style – and also that both creative style and leadership style have been found to have relationships with creative performance; therefore, creative style may be one of the elusive predictors of desirable leadership styles which is yet to be identified, or leadership style may mediate the positive relationship between creative style and creative performance.

This all leads to the three identified research questions which are aligned to the identified gaps in the literature, namely;

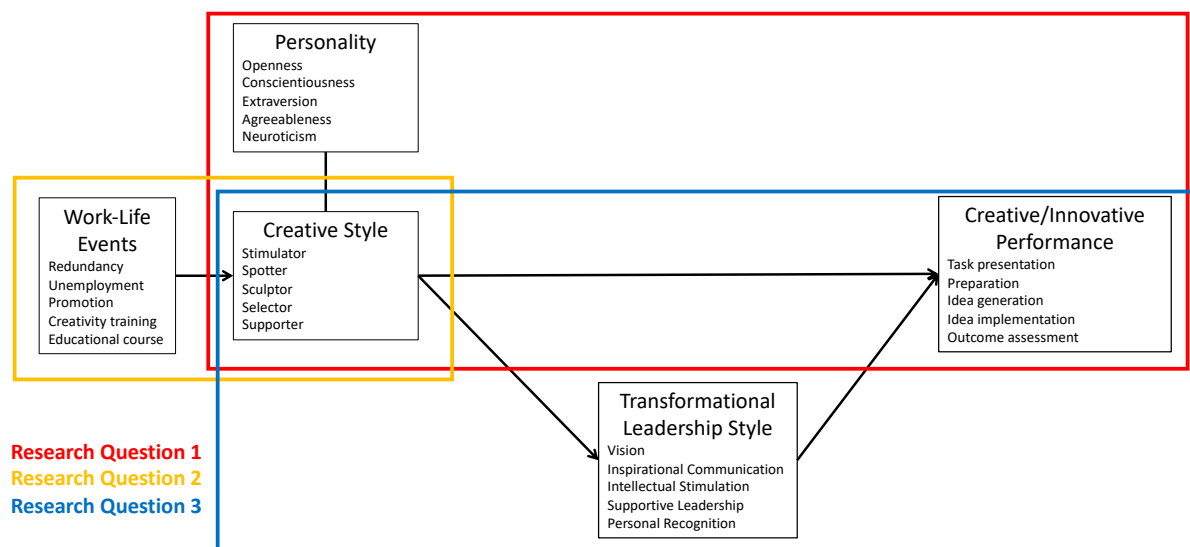
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- Research Question 1 - How robust is the Creative ID measure of creative style, and to what extent can creative style explain variance in performance at different stages of creative/innovative process beyond that which can be accounted for by Big Five Personality Domains alone?
- Research Question 2 - Is an individual's creative style more state-like or more trait-like in its changeability over time and which factors contribute to observed changes?
- Research Question 3 - Does an individual's creative style relate to their leadership style, and how do these styles at the leader level relate to follower creative/innovative performance?

The proposed theoretical framework (Figure 2.4) also found at the very start of this chapter, now includes more detail regarding which facets of each construct will be investigated, and how each of the three research questions map on to the model. This framework will form the basis from which testable research hypotheses will be developed. It should be noted that due to the complexity and number of variables involved, the entire framework will not be tested in a single study. It will be made clear which proposed relationships each research question and respective study is addressing.

Figure 2.4 – Proposed theoretical framework for the research



## **Chapter 3: Research Methodology**

This chapter outlines the research methodology and associated philosophical underpinnings of the current research. Firstly, ontology and epistemology will be defined and discussed in their relevance to the present research. Secondly, building on the epistemological and ontological stances adopted, the phenomenological approaches of positivism and interpretivism will be defined and discussed in terms of how the chosen approach shapes the current research. Thirdly, based on chosen research philosophy, a high level overview of the research methodology will be outlined. Finally, ethical considerations made in the design and implementation of the research will be covered.

### **3.1. Philosophical stance**

Ontology refers to the question: ‘what is the nature of reality?’. This can encompass a spectrum of beliefs – at one ‘end’ is the realist view that there exists one single reality, that this reality is experienced by everybody, and although individuals may have different views or perceptions of said reality, the single reality exists regardless and can be better understood through accurate measurement and observation. This view is often employed by areas of science such as physics and chemistry, whereby the discovery and confirmation of universally generalisable ‘rules’ and ‘laws’ for the world aim to be established through objective measurement of the world around us. At the other ‘end’ of the ontology spectrum is the relativist view that there is no single reality, and in fact there are an infinite number of ‘realities’, each, to some extent at least, constructed by an individual (or society) based on their own subjective experiences of the world. This view is often held by social sciences such as sociology and philosophy, whereby interpretations and reactions to reality are studied at an individual level to determine how each person sees, feels, interprets, and is affected by, the world around them without broadly generalising such findings to a wider population.

Epistemology is concerned with the types of information which contribute to knowledge, and the research methods used to obtain such information. More specifically, it refers to “the study of the criteria by which we determine (i.e. know) what does and does not constitute warranted or valid knowledge” (Gill & Johnson, 2002, p. 226). Should your ontological view be that there is a single objective reality to understand, your epistemological methods are likely to involve the collection of large amounts of objective, quantitative data which can be statistically analysed to allow generalisations and conclusions across large populations. In contrast, should your ontology be aligned to the view that each individual constructs their own reality, your epistemological methods are likely to involve the collection of in-depth qualitative data from a smaller population to better understand how individuals see, feel, affect, or are affected by their world.

Both of these views have their place in occupational psychology research – though the most prevalent view over time has been to consider there being a single reality to measure. The field has worked to understand constructs which are seen to be relevant and generalisable across large populations (Spector, 2001), such as; personality, motivation, thinking styles, learning styles, working style, etc. However, there is also much research at the individual level to determine how people see, feel, interpret, are affected by, and contribute to the workplace and world of work, with greater emphasis being put on developing and advancing ‘good’ methodologies in this area (Cassell & Symon, 2011). The more you take into account an individual’s unique views and experiences, the more specific in-depth information you gather in a specific domain, though depending on your philosophical stance, there is debate around the extent to which such qualitative research findings can be reliably generalised to a wider population (Ritchie & Lewis, 2003).

These contrasting views across ontology and epistemology create the foundations for a number of research philosophies, known as phenomenological approaches. There are many such approaches, which have evolved and built upon each other over time – this is an entire genre of research in itself. For simplicity, two of the ‘main’ approaches will be outlined here – namely positivism and interpretivism – it is often seen that occupational psychology researchers have a choice between these two opposing philosophies (Saunders et al., 2012), though this in itself is another contested notion with some arguing that your research philosophy should not be determined by a single established ‘position’, but rather by where your research questions best fall on multidimensional criteria, giving greater scope and flexibility to tailor a research philosophy to your own needs and research requirements (Niglas, 2010).

In the first of the two ‘main’ approaches, positivism adopts the view of there being a single world reality to learn from, that this reality is subjective and our knowledge about it can be gained through observation of cause and effect relationships. Positivists would argue that, based on the understanding of these cause and effect relationships, we can, to a reasonable degree, predict the future in terms of how one construct will impact upon another in certain contexts or conditions – and in line with this, positivist research is based upon pre-determined hypotheses of what their research findings will be, based on scientific evidence of the past. Alternatively, interpretivism would argue that each individual creates and perceives their own reality, and due to the person’s individual nature, future behaviour in a certain situation, or in the presence of a specified stimulus, cannot reliably be predicted across wider populations. With this approach, researchers would aim to achieve an

interpretative understanding of the subjects they are studying, without being able to generalise their findings to a wider population – therefore, research from this phenomenological approach would generally be a more inductive process, making conclusions from ongoing learning, rather than predicting outcomes prior to research.

In terms of these approaches and their relevance to the field of occupational psychology and the current research, as previously discussed, there has historically been a great focus on quantitative research (Spector, 2001) – gaining quantitative data from individuals, teams and organisations with the aim of understanding cause and effect relationships to help us better understand and predict outcomes and behaviour in the workplace. There is also the opportunity to employ robust, “good quality” qualitative methodologies at the individual level to better understand personal motivation, views and behaviour – though these methods and their findings continue to be seen as “a risky endeavour” and “harder to justify” than quantitative (Cassell & Symon, 2011, p. 647).

### **3.2. Research design and methods**

Primarily, the current research adopts a positivist approach - looking to discover objective facts, with quantitative data collected and statistically analysed with the aim of finding a ‘truth’ or a generalisable meaning through the testing of hypotheses. These hypotheses, stated in the relevant study chapters of this thesis (sections 4.1 and 5.2), aimed to address three main research questions:

- **Research Question 1:** *How robust is the Creative ID measure of creative style, and to what extent can creative style explain variance in performance at different stages of creative/innovative process beyond that which can be accounted for by Big Five Personality Domains alone?*
- **Research Question 2:** *Is an individual’s creative style changeable over time, and which work-life events could contribute to a change?*
- **Research Question 3:** *Does an individual’s creative style relate to their leadership style, and how do these styles at the leader level relate to follower creative/innovative performance?*

The reason for adopting a positivist phenomenological approach lies in the nature of the constructs being researched. Creative style refers to the way in which an individual prefers to be creative, although this could be researched in extensive qualitative detail with individuals; previous research has shown that in studies with large numbers of participants, there are common styles which can be deduced and attributed to large populations with an acceptable level of reliability and validity. The number of styles associated with an individual’s creativity is debated, with this number changing both

over time and between researchers, ranging from just two in Kirton's Adaption-Innovation Inventory (KAI) (Kirton, 1976, 1987, 1999), the four styles proposed by the FourSight tool (Puccio, 1999, 2002) up to the seven styles incorporated in the Creativity Style Questionnaire-Revised (CSQ-R) (Kumar et al., 1997). These measures of creative style (and others) have provided a foundation for the measurement and explanation of creative style in a way that is both (to varying extents depending on the measures used) reliable and valid, enabling generalisation across large populations. However, there are limitations to these measures which are discussed in greater detail in the Creative Style chapter of this thesis (section 2.2.4) and as such an alternative measure of creative style, the Creative ID will be used as the basis for the current research – comprised of potentially five distinct styles which can be measured using a 40 item survey, providing quantitative output suitable for statistical analysis alongside other constructs such as personality, job performance and leadership style. These constructs (personality etc.) also have well-established quantitative measures which lend themselves to the development of research hypotheses, the gathering of data to accept or reject such hypotheses in order to enhance our wider understanding of how these constructs, and the individuals involved, generally behave under certain conditions in the workplace. Therefore, a positivist stance, employing quantitative data collection methods has been chosen to provide the foundation for this thesis to build upon, and contribute further to, the existing body of knowledge and research already developed in this area.

Table 1 below summarises the aims, variables, participant population and statistical analyses utilised in each of the two studies presented in this thesis. Further detail relating to the construction of the research questions is presented throughout the literature review (sections 2.2.6, 2.3.5, 2.4.5); further methodological detail, along with the development of specific research hypotheses and presentation of results following statistical analyses can be found in the appropriate chapters addressing each study (sections 4.3, 4.4, 5.4). The purpose of Study 1 is to build upon existing knowledge of creative style, and to do this in four ways; firstly, to further validate a measure of creative style using existing and new data; secondly, to further explore relationships between creative style and Big Five Personality Domains. Thirdly, this study aims to further explore the relationships between creative style and creative/innovative performance which have been touched upon in previous research, whilst going into further depth to determine whether creative style can account for additional variance in creative/innovative performance beyond that which is accounted for by Big Five Personality Domains – this research aim required Study 1 to have a time-separated study design over two time points enabling creative style and Big Five Personality Domains to be measured at a different timepoint to creative/innovative performance, which allows for stronger inferences regarding whether creative

style or Big Five Personality Domains are seen to 'predict' performance, rather than simply correlate with it at a snapshot in time. Additionally, the collection of data across multiple timepoints helps to minimise the potential impact of common method variance whereby independent and dependent variables are measured in the same survey, by the same participants – potentially resulting in variance in the data that is attributable to the research design, rather than the constructs of interest themselves. Fourth and finally, Study 1 aims to better understand the nature of creative style in terms of how changeable it is over time, and which work-life experiences could contribute to an observed change – this is made possible by the data collection at two timepoints to observe any changes over time, and to evaluate whether these changes (if any) could be explained by certain work-life experiences which occurred between the timepoints. Based on the nature of these variables of interest the participant sample could be very broad in terms of job roles and responsibilities and all variables are measured at the individual level. Participant responses were required to be matched across time points, yet there was no requirement for matching of participants in terms of group membership as team/group level effects were not explored in this study.

As a key aim of this thesis and the associated research is to further validate the Creative ID measure of creative style – by completing those required analyses as part of Study 1, it allowed for the opportunity to make further alterations for the tool ahead of Study 2 should it have been found to be unsuitable. As will be outlined (section 4.5), this extra stage of refinement ahead of Study 2 was not deemed necessary.

Study 2 has the purpose of exploring new relationships not yet touched upon in any great depth by previous research - specifically looking into whether creative style and leadership style are related at the individual level, as well as looking into how these styles (both creative and leadership) at a leadership level potentially relate to creative/innovative performance at a follower level. This necessitated a study design across two levels of data collection, with a more targeted approach to participant recruitment which required both leaders and their respective followers matched to provide fit-for-purpose multilevel data.

*Table 3.1 – Summary of Research Aims and Design*

	<i>Study 1</i>	<i>Study 2</i>
<i>Addresses research question(s)</i>	<p><b>Research Question 1:</b> How robust is the Creative ID measure of creative style, and to what extent can creative style explain variance in performance at different stages of creative/innovative process beyond that which can be accounted for by Big Five Personality Domains alone?</p> <p><b>Research Question 2:</b> Is an individual's creative style changeable over time, and which work-life events could contribute to a change?</p>	<p><b>Research Question 3:</b> Does an individual's creative style relate to their leadership style, and how do these styles at the leader level relate to follower creative/innovative performance?</p>
<i>Variables of interest</i>	<p>Creative style Big Five Personality Domains Creative/innovative performance Work-life experiences</p>	<p>Creative style Leadership style Creative/innovative performance</p>
<i>Participants and data collection</i>	<p>Utilising historical data collected by online survey (between 2013-2020; N = 2785) to examine the robustness of the creative style tool.</p> <p>New data collected by online survey across two time points, 6 months apart, to address the explanation of variance in individual creative/innovative performance and changeable nature of creative style (Time 1 N = 411; Time 2 N = 303).</p> <p>All participants were adults, currently in employment, from a range of nations, organisations and job roles.</p>	<p>New data collected by online survey from both leaders and their followers at a single time point (N = 203; of which Leaders N = 78; Followers N = 125)</p> <p>All participants were adults, currently in employment, from a range of nations, organisations and job roles.</p>
<i>Statistical Analyses utilised</i>	<p>Confirmatory Factor Analysis Exploratory Factor Analysis Correlations Paired-sample t-tests Regression</p>	<p>Correlations Multilevel Analysis</p>

### 3.3. Ethical considerations

The current research is comprised of two studies, both of which were subject to a rigorous ethical approval process before the commencement of data collection or any contact with potential participants. This approval process ensured that all reasonable steps had been taken in the design of the research to ensure the safety of participants, the required maintaining of a data management plan and responsible use and storage of their data.

All individuals participating in the research were fully briefed on; the purpose of the research, that their participation was optional, that they could withdraw at any time, that they could obtain more information from the research team before participating, and that their responses would be recorded in such a way that they cannot be personally identified. Should they have wished, the participants could also receive updates regarding the findings of the research when appropriate. Should participants have had any concerns, queries or complaints regarding any element of the research or their participation which they felt could not have been adequately dealt with by the research team, a clear escalation process with contact details of senior university personnel was provided. Due to the nature of the research (i.e. researching the creative style of those in the workplace), participants were adults and employed at the time of completing the research. For Study 2 which involved leadership style as a research topic, participants were required to be in a leadership role (in this instance, defined as the 'line manager' of others in their workplace) and also be willing to pass on an online survey link to one of more of their followers (i.e. the people that they lead/manage/supervise). These participants ("followers") recruited by the leaders were also fully briefed on the purpose of the research, their participation etc. in exactly the same way as the leaders. The followers were only required to be adults currently in employment, in a position whereby they recognised the person recruiting them (the "leader") as their leader/manager/supervisor. No other demographic factors were considered to be a barrier in recruiting participants.

It was also clearly explained that any access to data collected would be limited to the wider research team, consisting of the researcher, supervisors and project sponsor. The project sponsor was primarily involved in the recruitment of participants for the research, with the academic research team (researcher and supervisors) responsible for the analysis of data, results, conclusion and discussion. This decision was made to minimise any potential conflict of interest, bias or influence due to the project sponsor being the owner of the Creative ID tool, the measure of creative style used throughout the research. To summarise this point for clarity - the project sponsor who owns the measure of creative style used in the research, provided organisational and personal access to a sample of research participants, but did not have any input into the analysis of data or research findings.

### **3.4. Summary**

In summary, this chapter has outlined the ontological, epistemological and phenomenological stances and assumptions of the research presented within this thesis – with the approach being positivist in nature, and therefore employing quantitative data collection methods and statistical analysis in the pursuit of exploring the research questions and hypotheses generated by the literature review. The



specific methodology of the two research studies have been established as being survey based – with one study collecting data at two timepoints; the other study collecting data at a single timepoint encompassing two levels of employee (leader and follower). Finally, the ethical considerations of the research and associated approval processes have been addressed.

## Chapter 4: Study 1

### ***Assessing a creative style measure, its relationship with creative/innovative performance and exploring the changeability of creative style***

In this chapter, the first research study is presented. This study addresses Research Questions 1 and 2, namely:

- Research Question 1: *How robust is the Creative ID measure of creative style, and to what extent can creative style explain variance in performance at different stages of creative/innovative process beyond that which can be accounted for by Big Five Personality Domains alone?*
- Research Question 2: *Is an individual's creative style changeable over time and which factors contribute to such changes?*

Each Research Question is addressed in turn, starting by building upon the main literature review (outlined in Chapter 2) to include additional research relevant to the specific research question being explored in this study, and to illustrate the development of the associated research hypotheses. Secondly, the methodology of the study is outlined in terms of the research sample, data collection and measures included in the research. Next, the data analysis strategy is discussed, with an outline of the statistical analyses used and research results presented; before finally adding a discussion relating to the research findings in the context of the proposed research hypotheses.

### **4.1. Research Questions 1 and 2**

***Research Question 1: How robust is the Creative ID measure of creative style, and to what extent can creative style explain variance in performance at different stages of creative/innovative process beyond that which can be accounted for by Big Five Personality Domains alone?***

This broad research question focuses on how to measure creative style, and what useful and tangible things that measurement can tell us. For clarity of the thesis, this research question will be split into two sub-questions (1a and 1b) relating to the measurement of the construct itself, and the relationship with other constructs respectively.

#### **4.1.1. Research Question 1a**

***How robust is the Creative ID measure of creative style?***

This section covers three main points: firstly, the presentation of previous academic research which has been conducted using the Creative ID tool to explore reliability and factor structure; secondly, discussing levels of reliability and validity achieved by existing measures of creative style; and finally, the approach taken in the current research to establish testable research hypotheses in relation to the robustness of the Creative ID as a measure of creative style in a way that contributes knowledge to the existing literature. It is acknowledged that there are a number of interpretations of robustness in the scientific literature, this thesis refers to robustness in terms of whether a measurement tool can be considered fit for purpose in terms of being both adequately reliable and valid. More specifically, the framework for establishing psychometric validity proposed by Hughes (2018), as introduced in section 2.2.4. will be referred to, with this terminology referenced where appropriate.

The importance of reliability and validity in psychometric tools can be summarised by the two questions stated by Hughes (2018): '*Is it accurate?*' i.e. does it measure what it is supposed to; and '*Is it useful?*' i.e. is it appropriate for use in a specific context, for a specific purpose and with a specific population. When measuring something about people for research purposes, you want those measures to consistently measure exactly what they set out to measure in a way that is appropriate for the purposes of the research. In terms of reliability, this manifests in measurement items which are designed to measure the same construct, obtaining consistent responses from a population – if four items are all aiming to measure a Stimulator creative style, you would expect participants to respond in a similar way to all of these items, as they are all measuring the same underlying construct and are free from error. This is often referred to as inter-item reliability, or structural evidence in Hughes's framework – another form of reliability is test-retest reliability whereby the same measure is tested on the same participants at multiple timepoints to determine if the measure is stable and performs consistently over time. Although important, this measure of reliability is not immediately assessed in relation to the Creative ID tool as it is not yet clear if the construct of creative style itself is changeable over time.

In terms of validity – this is about establishing whether the tool measures what it sets out to – if it claims to be a measure of creative style, we need to be confident that it actually measures creative style and is not mistakenly tapping into some other construct. In assessing the reliability and validity of psychometric tools, both the Creative ID and others, the following terminology will be referenced. *Structural evidence* refers to the inter-item reliability – i.e. consistency between items which all claim to be a measure of the same construct. In terms of validity, *face validity* refers to whether the tool

looks and ‘feels’ right, that it seems to measure what it sets out to measure – this is generally determined by expert raters in a relevant area. *Construct validity* refers to how well aligned a tool is to alternative established tools in the same/similar specialism. *Concurrent validity* refers to whether the outcomes of the tool relate to a particular outcome or behaviour – for example whether creative style predicts creative performance, or some other relevant performance or behaviour metric where a prediction is made with both predictor and criterion data collected at the same time. It is recognised that there are a number of further sources of evidence outlined in Hughes’s framework – these are not ignored in the current research and will be addressed further in the respective discussion and conclusion sections of this thesis. The unfortunate reality regarding the previous research into Creative ID, and other measures of creative style, is that either such a rigorous framework for assessing validity has not been adopted, or the relevant evidence is not readily discoverable to report and critique.

To the first point of presenting existing academic research which concerns the reliability, validity and factor structure of the Creative ID. As covered in greater detail in a previous chapter (section 2.2.5) the Creative ID tool was initially developed by creativity and innovation industry experts in 2004, before forming a relationship with the University of Sheffield since 2008 to further assess, develop and validate the tool. This validation to date has been the focus of three, as yet unpublished, academic research studies. Each adding insight to the systematic approach used in developing the tool which is now in its fourth iteration.

- The first study involved 165 participants and explored the Creative ID items alongside measures of idea generation and implementation at work, the Big 5 personality dimensions, supervisor support and time pressure (Becker, 2009) – the main findings of this research were in establishing relationships between creative style and personality traits, specifically noting significant positive relationships as expected between three of the creative styles (Stimulator, Spotter and Selector) with openness to experience (correlation range  $r = .21$  to  $r = .61$ ); additionally the Selector creative style was positively related to conscientiousness ( $r = .25$ ); also the Supporter creative style with agreeableness ( $r = .61$ ), all as expected and statistically significant. Regression analyses found that openness to experience accounted for a significant amount of variance in four of the five creative styles (Stimulator, Spotter, Selector and Supporter;  $R^2$  range .06 (6%) to .20 (20%)); with agreeableness accounting for 45% of the variance in the Supporter creative style; and conscientiousness accounting for 5.5% of the variance in the Selector creative style. As stated in section 2.2.5, the Creative ID tool (when

reduced to 21 items and the Sculptor factor removed) achieved a four-factor EFA solution (factor loadings  $>.4$ ;  $\alpha$  range .63 to .80).

- The second study involved 610 participants and explored the Creative ID items alongside measures of idea generation and implementation, creative self-efficacy, creative motivation, incivility climate for risk taking, tolerance for failure, autonomy and time pressure (Rabbetts, 2010), this research identified significant positive relationships between all five creative styles (Stimulator, Spotter, Sculptor, Selector, Supporter) with creative self-efficacy, intrinsic motivation, self-report idea generation performance and self-report idea implementation performance. When reduced to 25 items, the Creative ID achieved a five-factor EFA solution (factor loadings  $>.4$ ;  $\alpha$  range .678 to .857).
- The third study involved 156 participants and explored the Creative ID items alongside measures of idea generation and implementation, Holland's Vocational Types, job characteristics and job satisfaction (Johansen, 2011) – the key findings of this research involved finding significant positive relationships between the Stimulator creative style and a preference for artistic job types; similarly with the Sculptor creative style and artistic roles. Also, this research found a significant negative relationship between the Stimulator creative style and a preference for conventional job types, as well as a negative relationship between the Spotter creative style and social type roles. A satisfactory EFA solution was not found with this version of the Creative ID tool.

Each of these three studies made some amendments to the Creative ID tool through the deletion of items to ensure a stronger level of reliability in the measure – through each of these research projects, guidance and feedback was provided to Creative Creatures outlining the perceived 'stronger' and 'weaker' items in the scale with the aim of assisting the organisation in their aim to refine and improve the reliability and validity of the measure with each subsequent iteration.

In terms of the Creative ID, the iterative development process has led to a good level of inter-item reliability (structural accuracy) for the Creative ID tool. A factor analysis of the latest version of the Creative ID tool (version 4) produced the desired five-factor solution with each style having a good Cronbach's alpha of internal reliability of above 0.7 as follows (N = 548): Stimulator – eight items  $\alpha = .88$ ; Selector – eight items  $\alpha = .80$ ; Supporter – eight items  $\alpha = .79$ ; Spotter – eight items  $\alpha = .79$ ; Sculptor – eight items  $\alpha = .81$  (Birdi, 2012). To clarify, these statistics relate to the latest version of the

Creative ID tool (version 4) which is yet to be used in any empirical research, yet is the measure of creative style used in the research presented in this thesis. Further statistical analyses of the tool are presented as appropriate in Study 1 (section 4.3) utilising previously unused data. It is recognised that, in line with the framework put forward by Hughes (2018), that valuable further evidence to support the accuracy of the Creative ID tool would come from: content evidence which would demonstrate that the tool comprehensively captures the target construct (in this case creative style) in its entirety; evidence relating to response processes to establish the mechanism by which the target construct causes specific responses to the items used; and evidence of stability across groups to demonstrate that the content, structure and response processes all remain stable across differing participant groups. The current research looks to establish a level of content evidence, with other sources considered as appropriate as part of future research suggestions.

This brings us to the second point of this section – to establish the accepted benchmarks of reliability and validity of creative style measures. Table 2.5 provides an overview of the creative style measures found in terms of their format, reliability and validity (which could be considered accuracy and appropriateness) – included are those from the literature review (section 2.2.4), and some popular commercially available tools which are worthy of inclusion due to their prevalence and usage in the market. The table ends with Creative ID, the tool used in the present research, following other tools in order of their prevalence in the literature. Any statistics and figures included are deemed to be statistically significant. The table outlines general characteristics of each creative style measure including the name and how many items the participant is required to respond to. The table indicates the number of dimensions the tool aims to measure – e.g. the number of separate creative styles, and if these styles are further divided into subdimensions. When referring to reliability and validity, the testing population for establishing these figures is stated, as well as the inter-item reliability (structural evidence) – a generally accepted statistical norm for inter-item reliability of each factor within the measure would be  $\alpha > .7$  (Lance et al., 2006), however others consider this only applicable to the early stages of research for ruling out obviously unsuitable measures, with scales used in applied research requiring  $\alpha > .8$  or even higher depending on the usage of the research and real-world implications of such judgements (Nunnally, 1978). Bearing this in mind, the reliability requirements for the current research, and alternative measures of creative style, could consider  $\alpha > .8$  as an ideal benchmark to aspire to, though  $\alpha > .7$  can be considered acceptable. Validity information provided includes: face validity (the confirmation from experts that the tool ‘looks/feels/seems right’); criterion validity which explains significant relationships between creative style and other constructs in terms of creative style ‘predicting’ or explaining variance in outcome variables such as creative performance;

and finally, construct validity which highlights the significant relationships between creative style(s) and other theoretically related constructs such as personality traits. All validity information provided has been drawn from statistically significant findings (such as the generally accepted norm in social science of  $p < .05$ ). Again, it is recognised that further evidence to support the appropriateness of psychometric measures would be desirable to further establish validity – in terms of aligning the measure to existing measures of the same construct (convergent), or distinguishing from alternative constructs (discriminant); being able to use the outcome of the measure to predict other outcomes longitudinally (predictive), cross-sectionally (concurrent) or adding predictive value over and above that of another measure (incremental). Further types of evidence are valuable, though less frequently reported, relating to a measure adequately discriminating between differing groups (known groups), as well as reporting the consequences of test use and practical concerns relating to the use of the tool.

The final point of this section aims to consider the research so far, both in terms of studies involving the Creative ID and literature on alternative measures, and to use this information in the development of testable research hypotheses from which the research questions of interest can be explored.

Building upon the previous research findings for the Creative ID measure of creative style in terms of the tool's reliability and factor structure (Becker, 2009; Johansen, 2011; Rabbetts, 2010), the current research will conduct analyses upon the latest iteration which is yet to be included in any formal academic research. Previous iterations have indicated there to be a five-factor structure, with five distinct styles of *Stimulator*, *Spotter*, *Sculptor*, *Selector* and *Supporter* being identified – as noted (in section 2.2.5), the five styles have obtained suitable levels of face validity from academic experts in the field of organisational creativity and innovation, as well as organisational practitioners in these areas who deem each of the five styles to be relevant to creativity/innovation, whilst being broad enough to encompass the range of creative preferences displayed in organisations without the need for further styles to be incorporated (an early basis for content evidence of accuracy). Additionally, as outlined above, the five styles have been found to be related to personality traits as hypothesised (Becker, 2009). Furthermore, previous research has indicated the five creative styles to be positively correlated with measures of both creative and innovative performance – this adds to the notion of creative style being incorporated into the 'creativity related processes' area of the Dynamic Componential Theory (Amabile & Pratt, 2016) as an antecedent of individual creative/innovative performance. This theory also references leader-related elements as creativity related processes that can promote creative/innovative performance – this is where the Creative ID goes beyond other measures of creative style (such as FourSight) as including the Supporter creative style brings in the

element of ‘other-focus’ which has not featured in other tools to date, yet is deemed relevant for creative/innovative performance both from a theoretical (i.e. the Dynamic Componential Theory) and practical (i.e. face validity of experts in the field) perspective. It should be noted that the previous MSc projects (due to understandable time constraints) all analysed data from a single time point when exploring relationships between creative style and other constructs such as performance – the research presented in this thesis (specifically Chapter 4: Study 1) utilises two timepoints, therefore reducing common method bias and allowing stronger inferences to be made regarding predictive relationships.

To date, other measures of creative style have not established a statistically acceptable level of inter-item reliability (structural evidence) for a tool that includes more than four factors, or including factors that encourage creative/innovative performance in others as well as the self, as can be seen in Table 2.4. Therefore, should the Creative ID tool fit the five-factor model as proposed, this would imply a development in theory relating to the construct of creative style in that additional factors than previously identified can be measured, implying a broader or more nuanced construct than previously assumed – indicating a level of content validity whereby the measure more comprehensively captures the target construct. Furthermore, previous iterations of the Creative ID tool have only been analysed using exploratory factor analysis (EFA) methods, whereas the current research will use a more rigorous approach to establishing the factor structure and underlying model of the tool, using both EFA and CFA (confirmatory factor analysis) techniques. Based on the available literature, it is believed that alternative measures of creative style have also been analysed using EFA alone, as there are no discoverable results in relation to the model fit statistics that one would report as the result of a CFA analysis. Therefore, the Creative ID tool will be assessed using more sophisticated and rigorous statistical techniques than those used previously to better establish the reliability of the tool and the structural validity. This brings us to the first of our research hypotheses:

***Hypothesis 1 – The Creative ID measure of creative style fits a five-factor model structure aligning to the posited Stimulator, Spotter, Sculptor, Selector and Supporter dimensions.***

#### **4.1.2. Research Question 1b**

***To what extent can creative style explain variance in performance at different stages of the creative/innovative process, beyond that which can be accounted for by Big Five Personality Domains alone?***



This section covers two main points: firstly, the presentation of previous academic research which has been conducted using the Creative ID tool to explore relationships with personality and workplace performance, to establish the validity of the tool – specifically, construct validity in terms of whether particular creative style correlate with personality traits as would be expected given their respective definitions, and predictive or concurrent validity in terms of creative styles of an individual correlating with and/or predicting relevant workplace performance. The second point of this chapter is to present the development of testable research hypotheses in relation to creative style (as measured by the Creative ID tool) accounting for variance in job outcomes when assessed alongside measures of personality.

Continuing the discussion of the previous research involving the Creative ID tool (section 2.2.5) – construct (or convergent) validity is indicated through correlation with openness to experience, the personality trait most closely associated with creativity (Baer & Oldham, 2006; Feist, 1998; George & Zhou, 2001) – analyses show that the Stimulator, Spotter and Selector creative styles all significantly correlate with openness as would be expected given their respective definitions (Becker, 2009). Openness was not found to correlate with the Supporter creative style, this is also to be expected as the style least associated with the stereotypical definition of creativity – however, the Supporter creative style was found to significantly correlate with agreeableness which would be as expected given the nature of this style in supporting and facilitating others (Becker, 2009). The Creative ID measure also shows criterion validity relating to predicting innovation performance in the workplace in terms of generating new ideas and implementing new ideas. All five creative styles as measured by the Creative ID were found to be significantly and positively related to innovation performance (Rabbetts, 2010). Each of these findings were discovered from research using previous iterations of the Creative ID tool, the research presented in this thesis will be utilising new data, as well as the latest version of the Creative ID tool.

In further replicating previous research findings it is expected that all creative styles as measured by the Creative ID will significantly correlate with measures of creative/innovative performance. However, these measures of performance will differ from previous research involving the Creative ID tool in that they are aligned to Amabile's model of innovative work behaviour, as set out in the Componential (1983) and Dynamic Componential Theory (Amabile & Pratt, 2016). The five creative styles as measured by the Creative ID are briefly defined below, with Table 4.1 illustrating how these are expected to relate to the stages of innovative work behaviour processes.

- Stimulator - stimulating refers to generating streams of new and challenging ideas; a divergent & disruptive style.
- Spotter – spotting refers to combining pieces of information, or seeing patterns and connections, to identify potentially beneficial opportunities; an abstract and intuitive style.
- Sculptor – sculpting refers to developing and building upon existing ideas, making complex things simple, tangible and concrete
- Selector – selecting refers to thinking convergently in evaluating options and making logical decisions when problem solving, setting context and focusing on an end goal.
- Supporter – supporting refers to encouraging, offer guidance and otherwise get the best performance from others; empowering, collaborative and fostering an environment for growth.

*Table 4.1 – Creativity and Innovation process and the Creative ID creative styles*

Amabile (1988) Stages	Key skills/tasks	Primary creative style for this stage	Creative style definition
1. Task Presentation	Identifying opportunities Motivation to engage in a task Setting task expectations and requirements	Selector	Thinking convergently in evaluating options and making logical decisions when problem solving, setting context and focusing on an end goal
2. Preparation	Gathering required resources Recalling relevant information from previous experience	Spotter	Combining pieces of information, or seeing patterns and connections, to identify potentially beneficial opportunities; an abstract and intuitive style
3. Idea Generation	Producing novel and useful ideas	Stimulator	Generating streams of new and challenging ideas; a divergent & disruptive style
4. Idea Validation	Relating abstract ideas to concrete plans Assessing ideas against required criteria	Selector	Thinking convergently in evaluating options and making logical decisions when problem solving, setting context and focusing on an end goal
5. Outcome Assessment	Decision making Determining task success/failure and choosing future actions based on task expectations and requirements	Selector	Thinking convergently in evaluating options and making logical decisions when problem solving, setting context and focusing on an end goal

In exploring such relationships, and therefore indications of predictive validity in terms of whether certain creative styles are seen to relate to creative/innovative performance, the results aim to contribute to the existing theory on creative style. The current position, driven by the dominant Kirton Adaption-Innovation Inventory, is that creative style and creative ability are entirely separate – that the extent to your preference for behaving in a certain way when pursuing creative outputs has no relationship to your level of success in achieving those outputs. The current research position is in agreement that everybody has a preferred creative style/s, and that this is relevant and generalisable to all levels of creativity; however, to claim that a measure of creative style is entirely distinct from the level of creative outcome begs the question of what exactly the measure of creative style does relate to, and what practical benefit there is of measuring and improving our understanding of the construct. The current research proposes that the creative style is positively related to creative performance in a relevant context, though this context does not have to be at the industry breakthrough level of creative achievement and applies to everyday creativity activity which is achievable by all. Should these positions be supported through empirical research, this will improve the knowledge of creative style, how this aligns to personality traits and potentially predicts performance and different stages of the innovation process – something not yet established in the literature. There are also limitations regarding the statistical methodologies to the previous research using this measure of creative style – as mentioned previously (section 2.2.5) these unpublished studies have not assessed the Creative ID measure using CFA (only EFA), meaning the data have been explored to indicate the factor structure, but not then confirmed via fit statistics to show the exactly how well data fit the proposed model.

Finally, the research aims to determine whether creative style can account for more variance in job outcomes than personality measures alone. Based on the previous research, it has been shown that there is a level of concurrent or predictive validity for the Creative ID tool in relating to job outcomes – specifically, idea generation and idea implementation. This has also been the case for the KAI (Puccio et al., 2000) however, a significant criticism of creative style measures is that they have not been found to account for any significant variance in such job outcomes after controlling for personality (von Wittich & Antonakis, 2011). The current research aims to address this criticism to explore whether creative style, as measured by the Creative ID, is able to account for additional variance in job outcomes beyond that explained by personality measures – therefore achieving evidence of incremental validity. The rationale behind this position lies in the definitions of the constructs as outlined in Table 4.2 – though it is expected that creative styles will correlate with personality traits as per previous research findings; the definition of each creative style is generally broader than that

of the personality trait most closely associated with it. Whereas openness to experience can be thought of as people who are curious, imaginative, artistic, excitable, unconventional and have wide interests (Costa & McCrae, 1992), and has been seen to predict creative performance (Batey et al., 2009; Feist, 1998; Grosul & Feist, 2014; Patterson & Zibarras, 2017; Tan et al., 2019) – stimulating, spotting and sculpting are more than simply being open to new experiences through curiosity, imagination etc. They encompass more complex behaviours and preferences beyond that which the definition of openness to experience accommodates – such as thinking divergently to generate ideas in a prolific fashion (in the case of Stimulator); or combining information, spotting patterns and identifying opportunities (Spotter). It is acknowledged that each of these creative styles benefits from, and to some extent has a requirement for, openness to experience – but openness in itself does not encompass the full range of the creative styles being measured. Therefore, although it is expected that creative styles and personality traits will correlate, and there will be shared variance accounted for in creative/innovative performance, there is something else to be measured by creative style than personality traits alone. Furthermore, the majority of research linking openness to experience with creative/innovative performance has been in the measurement of idea generation or the self-perceived ability to come up with novel ideas (Tan et al., 2019), whereas the current research is looking at the full creative/innovative process, where idea generation accounts for just one of the five stages.

Table 4.2 – Creative style definitions aligned to personality trait definitions

Creative style	Personality trait (Costa & McCrae, 1992)
Stimulator – generating streams of new and challenging ideas; a divergent & disruptive style	Openness – people who are curious, imaginative, artistic, excitable, unconventional and have wide interests.
Spotter – combining pieces of information, or seeing patterns and connections, to identify potentially beneficial opportunities; an abstract and intuitive style	Openness – people who are curious, imaginative, artistic, excitable, unconventional and have wide interests.
Sculptor – developing and building upon existing ideas, making complex things simple, tangible and concrete	Openness – people who are curious, imaginative, artistic, excitable, unconventional and have wide interests.
Selector – thinking convergently in evaluating options and making logical decisions when problem solving, setting context and focusing on an end goal	Conscientiousness – people who are efficient, organised, dutiful, thorough, disciplined and not impulsive.
Supporter – encouraging, offer guidance and otherwise get the best performance from others; empowering, collaborative and fostering an environment for growth	Agreeableness – people who are forgiving, straightforward, warm, compliant, modest and sympathetic.

In summary, in terms of establishing construct or convergent validity, it is expected that previous research findings be replicated, albeit this time using the latest iteration of the Creative ID tool. This leads us to the next hypotheses which relate to the relationships between creative styles and the Big 5 personality traits.

***Hypothesis 2a – The Stimulator creative style positively correlates with openness to experience, to a greater extent than with other personality traits.***

***Hypothesis 2b – The Spotter creative style positively correlates with openness to experience, to a greater extent than with other personality traits.***

***Hypothesis 2c – The Sculptor creative style positively correlates with openness to experience, to a greater extent than with other personality traits.***

***Hypothesis 2d – The Selector creative style positively correlates with conscientiousness, to a greater extent than with other personality traits.***

***Hypothesis 2e – The Supporter creative style positively correlates with agreeableness, to a greater extent than with other personality traits.***

Referring back to Table 2.5 each of the five creative styles as measured by the Creative ID has been aligned to the stage of the innovative creative/innovative process which is deemed to be most relevant. In establishing concurrent or predictive validity, the following testable research hypotheses have been developed from the rationale that the creative style indicates an individual's preference and tendency, and this will result in higher performance in the most closely related domain of creative/innovative performance. For example, the Stimulator creative style involves coming up with new ideas, therefore this is expected to relate to performance in terms of idea generation. Given that this is the creative style which is theoretically the closest in alignment to idea generation activity, it is expected that this creative style will not only be positively related to idea generation performance, but will show a stronger relationship with idea generation performance than any other creative style.

***Hypothesis 2f – The Stimulator creative style is positively related to perceived levels of performance at the idea generation stage; it will show a stronger relationship with idea generation performance than other creative styles.***

Similarly, the Spotter creative style demonstrates handling data, spotting patterns and identifying opportunities – this makes it the most logical creative style to be most closely aligned to the preparation stage of the creative/innovative process as this involves identifying and gathering the

resources required to complete an upcoming task. Again, it is expected that the Supporter creative style will be positively related to preparation performance – whilst showing a stronger relationship with preparation performance than other creative styles.

***Hypothesis 2g – The Spotter creative style is positively related to perceived levels of performance at the preparation stage; it will show a stronger relationship with preparation performance than other creative styles.***

The Selector creative style demonstrates convergent thinking, logical assessment and objective decision making – this makes it the most logical creative style to be most closely aligned to the task presentation, idea validation and outcome assessment stages of the creative/innovative process. The task presentation stage is associated with choosing which tasks to pursue, including making logical decisions and selecting from a number of potential options; the idea validation stage also involves objective decision making and assessment; with the outcome assessment stage involved in looking back over the creative/innovative process to objectively assess the performance of the endeavour, if it achieved its goals, and making decisions around next steps. It is expected that the Selector creative style will be positively related to each of these stages of creative/innovative performance, as well as show a stronger relationship with these measures of performance than other creative styles.

***Hypothesis 2h – The Selector creative style is positively related to perceived levels of performance at the task presentation stage; it will show a stronger relationship with task presentation performance than other creative styles.***

***Hypothesis 2i – The Selector creative style is positively related to perceived levels of performance at the idea validation stage; it will show a stronger relationship with idea validation performance than other creative styles.***

***Hypothesis 2j – The Selector creative style is positively related to perceived levels of performance at the outcome assessment stage; it will show a stronger relationship with outcome assessment performance than other creative styles.***

For clarity, the absence of the Sculptor and Supporter creative styles in these research hypotheses should be elaborated upon. Firstly, the Sculptor creative style demonstrates building upon the ideas of others, and taking abstract ideas and making them into implementable action plans – this means

that theoretically it is most likely to be aligned to the idea generation and idea validation stages of the creative/innovative process as these involve both generating new ideas and new methods for implementing ideas, but also determining which ideas to take forward and build upon. However, although the Sculptor creative style is expected to be aligned to these stages of the creative/innovative process, it is not expected to have a stronger relationship than other creative styles as hypothesised above. Secondly, the Supporter creative style is predominantly focused on improving and facilitating the success of others, rather than personal achievement and therefore is not expected to have relationships with creative/innovative performance which are stronger than those observed with other creative styles.

Finally, based on all of the literature and reasoning covered in this section of the thesis – in determining whether creative style, as a construct, can meaningfully predict performance beyond that already accounted for by other measures and demonstrate evidence of incremental validity, one further hypothesis is formulated:

***Hypothesis 3 – Creative style(s) accounts for a significant amount of additional variance in creative/innovative performance beyond that explained by personality traits alone.***

#### **4.1.3. Research Question 2**

***Is an individual's creative style changeable over time, and which work-life events could contribute to a change?***

This section covers three main points: firstly, addressing research which has been conducted to date to establish whether an individual's creative style changes over time; secondly, to outline how the experience of work-life events could contribute to a change in creative style over time, with the development of testable research hypotheses; and finally, the approach taken in the current research to test the aforementioned research hypotheses in terms of the study methodology.

To date there has been no discoverable research into the existence of, or extent of, changeability in an individual's creative style over time – based on the literature reviews outlined previously (section 2.3.2) each of the published studies which can be seen in involve a measure of creative style either does not have a methodology with more than a single timepoint, or if there are multiple timepoints in the research, creative style is only measured once. To clarify, in all discoverable research involving

the measurement of creative style, these styles are measured at a single timepoint – it is not known how an individual's creative style preferences change over time, the level of changeability, or what could contribute to an observed change. In determining whether an individual's creative style changes over time, and to establish the expectations of such a change (or expectations of no change), it is important to look into the literature to determine whether there is evidence for constructs which are similar, or related to, creative style for which the changeable nature over time has been explored and/or confirmed. This leads to research into personality traits – a number of correlations between creative style and personality traits have been identified – in terms of the KAI (Kirtan, 1976, 1987, 1999) measure, it has been found that the innovator creative style positively correlates with extraversion and openness to experience; with the adaptor creative style correlating with agreeableness, conscientiousness and neuroticism (von Wittich & Antonakis, 2011). Given the nature of the KAI putting adaptor and innovator at opposite ends of a continuum, the reverse correlations are also implied i.e. adaptor creative style negatively correlating with extraversion and openness to experience, and the innovator creative style negatively correlating with agreeableness, conscientiousness and neuroticism – this leading von Wittich and Antonakis to question “The KAI cognitive style inventory: Was it personality all along?” (2011, p. 1044). The FourSight creative style measure has been found to correlate with the Myers-Briggs Type Inventory (MBTI) (Puccio, 2002) with the Clarifier and Developer creative styles significantly correlating with Judging; the Ideator creative style with perceiving and intuition. These are logical correlations given the definitions of the constructs, and unlike the KAI, is actively encouraged as a source of validity for the FourSight tool by the creators. However, the extent of the criticism into the MBTI as a measure itself leaves questions hanging over any conclusions drawn from its inclusion in research. In unpublished research, creative styles as measured by the Creative ID tool have also been found to correlate with personality traits – specifically, the Stimulator, Spotter and Selector creative styles positively correlating with openness to experience; and the Supporter creative style positively correlating with agreeableness (Becker, 2009; Johansen, 2011; Rabbetts, 2010)

The reason for highlighting the links that have been made between creative styles and personality traits is that, although there is a lack research which has specifically focused on the changeable nature of creative style over time, in contrast there is an abundance of research into how personality traits are thought to be generally stable over time. Logically, should creative styles be strongly correlated to personality traits, or even predicted by personality traits, this could imply that their nature over time – that is, their changeability – also be similar. However, as highlighted in the previous literature review (section 2.3.3), research findings suggest that the nature of personality traits over time is far from set



in stone and can vary over time due to a number of factors such as; unemployment (Boyce et al., 2015), job stress (Smallfield & Kluemper, 2021; Wu, 2016), job insecurity (Wu et al., 2020), aging (Debast et al., 2014), chronic disease, entering work, beginning a relationship and starting university (all Leikas & Salmela-Aro, 2015). Additionally, it has been noted that personality traits have been seen to follow a general development trend over time where neuroticism declines over time, while agreeableness and conscientiousness increase, likely due to the need to assume different responsibilities and roles throughout life (e.g. Roberts & Mroczek, 2008; Chan et al., 2012; Costa et al., 2019). The alignment between creative style and personality traits would lead us to consider the possibility that creative styles are generally stable over time, yet could (in some instances) be influenced by specific life experiences, or alternatively distinct styles may follow their own 'development' trajectories over time. The research simply has not been done on the nature of creative style over time, though in line with the discussed literature on personality traits, it can be posited that although creative styles may generally remain stable over time in that people generally have certain preferences and tendencies for the way they work – some styles may be more changeable than others over time based on the roles and responsibilities undertaken by the individual over the course of their working career. For example, as an individual progresses through their career, they are more likely to be promoted and gain responsibility in leadership positions – this may lead to a responsibility or requirement to consider the needs of others and their performance, therefore increasing the individual's level of Supporter creative style over time. In contrast a tendency or preference to come up with lots of diverse ideas (Stimulator creative style) may be something that is more stable as a general working preference across the working career, regardless of age or leadership seniority.

The following section will explore which work-life experiences could be hypothesised to contribute to a change in an individual's creative style over time. As previously mentioned in the literature review (section 2.3.4), the life experiences seen to contribute to a change in an individual's personality traits over time could be considered as things which are either; a negative experience that is often unplanned; a more positive experience that is planned or at least expected; or the inevitability of aging. These experiences span a range of life contexts across personal lives, working lives, personal achievements, interpersonal relationships etc. This is appropriate as personality traits are deemed to be relevant across all such contexts. In contrast, creative style, and the measurement of creative style as it is set out in this thesis and the associated research, is solely focused on the pursuit and attainment of creativity and innovation in an occupational or workplace context. Therefore, the experiences of interest for the current research were of a work-life nature – either negative experiences that would

usually be unplanned and/or generally avoided, or positive experiences that would usually be planned, expected and/or actively sought out.

The findings from studies into changing personality traits over time indicate that the experience of negative events (such as unemployment, job stress, job insecurity and chronic disease) lead to a significant reduction in agreeableness (Boyce et al., 2015; Wu et al., 2020), conscientiousness (Boyce et al., 2015; Wu, 2016), openness to experience (Boyce et al., 2015) and extraversion (Wu, 2016). Furthermore, negative work-life events have been found to lead to a significant increase in neuroticism (Leikas & Salmela-Aro, 2015; Wu, 2016; Wu et al., 2020). These empirical findings are also supported by the theoretical model posed by Smallfield and Kluemper (2021). The expected correlations between creative styles and personality traits are that openness to experience is expected to positively correlate with the Stimulator, Spotter and Selector creative styles; and agreeableness to positively correlate with the Supporter creative style. This leads us to expect that an experience of negative work-life events would lead to a decrease in Stimulator, Spotter and Selector creative style over time, in line with the respective personality trait correlations. The same could be said of the Supporter creative style due to the correlation with agreeableness.

The starting point for identifying the relevant work-life events came from Kandler et al.'s (2012) index of 31 life-events, each with an associated scale between 0 and 1 for perceived control (indicating how much control an individual feels they have over this experience) and for positive valence (indicating the level of positivity associated with the experience). The items from this measure which are specifically applicable to a work-life context include; promotion in the workplace, start of professional training, three months of unemployment, and birth of a child among others, therefore it is this selection of relevant items (detailed in section 4.2.3) which are utilised in the current research. This measure in particular was chosen for reference due to the scaling for positive valence which provides an indication of whether certain events are more likely to be viewed as positive (scored closer to 1) or negative (closer to 0); therefore providing a way of classifying experienced events into those which are perceived to be more positive/negative as appropriate.

The negative work-life events which are of interest to the research are: experiencing redundancy and experiencing 3 months of involuntary unemployment. These specific events were chosen due to the research into personality traits (which for the purposes of the current research are proposed to behave similarly to creative styles in their level/nature of changeability over time) which found that the experience of unemployment and job insecurity contributed to a change in certain personality

traits over time (Boyce et al., 2015; Wu, 2016; Wu et al., 2020). It was noted that measuring these events could be achieved with minor wording changes from an established scale from published research. These have been derived from Kandler's scale items of 'Lay-off by employer' and 'More than three months of unemployment', which scored .18 and .36 respectively for positive valence – this means (on a scale of 0 being considered to be absolutely negative, and 1 being considered to be absolutely positive) that most people, most of the time, would consider these events to be a negative, undesired experience.

In determining which work-life experiences to include in the research, given the lack of existing research into which events could contribute to a change in an individual's creative style over time, there is no precedent to build upon and therefore a certain amount of logical inference needs to be applied. Based on the previously discussed research into the changeability of personality traits over time, one of the mechanisms thought to facilitate the link between the experience of certain work-life events and a change in personality traits is that of a need or requirement to express traits. Specifically, this refers to situations where an individual experiences an event and this means that, compared to their situation before experiencing the event, they have less need or requirement to exhibit or express certain traits. Boyce et al. (2015) provide the example of unemployment, whereby the person experiencing unemployment no longer has the same level of goal-focus and high motivation (both tendencies associated with conscientiousness) that was encouraged and required in their working life, therefore inducing a decrease in the conscientiousness personality trait due to this no longer being needed as much, encouraged as much, or being in a context to demonstrate as much. This same outcome of a decrease in conscientiousness has been seen in people who retire from work (Specht et al., 2011) which the authors theorise to have occurred through the same mechanism of no longer having the need or requirement to exhibit certain traits. This mechanism of 'requirement' is also relevant in research identifying increases in levels of personality traits over time – for example Leikas and Salmela-Aro (2015) found that people starting university, a new relationship or a new job demonstrated an increase in conscientiousness which could be explained in the way that they gained a need to be more goal-focused, achievement focused and keen to demonstrate commitment to something – therefore their self-identified personality traits were seen to alter as a result to become more 'fit for purpose' or 'fit for context' in the view of the individual. It is by this mechanism of 'requirement' that the current research proposes that an individual's self-reported creative style could change over time – based on the experience of certain work-life events, the context in which an individual lives and works is altered, giving them more/less need to display or engage in certain creative style preferences.

The findings from studies into changing personality traits over time indicate that the experience of positive events (such as entering work, beginning a relationship and starting university) leads to a significant increase in conscientiousness (Leikas & Salmela-Aro, 2015). This leads us to expect that an experience of positive work-life events would lead to an increase in Sculptor creative style over time, in line with the respective personality trait correlations. The positive work-life events which are of interest to the research are: starting a new educational course, experiencing creativity training (both considered to have similarity to starting university) and being promoted to a leadership position. These have been derived from Kandler's scale items of 'Start or finish of professional training' and 'Promotion in the workplace', which scored .97 and .98 respectively for positive valence.

Based on previous research indicating that creative style(s) have relationships with personality trait(s), and the extent of the literature into the changeability of personality traits over time, this appears to be the most solid theoretical grounding for making predictions regarding the changeability of creative style over time. The experience of negative work-life events such as redundancy and involuntary unemployment result in a lack of opportunity to work, and therefore by the mechanism outlined above, a lack of need to engage in or display creative styles as, by definition, these are all styles which illustrate an individual's current tendencies when approaching their work.

***Hypothesis 4a – There will be a significant decrease in Stimulator creative style following experience of redundancy or unemployment (negative work-life events) in the preceding six months.***

***Hypothesis 4b – There will be a significant decrease in Spotter creative style following experience of redundancy or unemployment (negative work-life events) in the preceding six months.***

***Hypothesis 4c - There will be a significant decrease in Sculptor creative style following experience of redundancy or unemployment (negative work-life events) in the preceding six months.***

***Hypothesis 4d - There will be a significant decrease in Selector creative style following experience of redundancy or unemployment (negative work-life events) in the preceding six months.***

***Hypothesis 4e - There will be a significant decrease in Supporter creative style following experience of redundancy or unemployment (negative work-life events) in the preceding six months.***

In contrast the experience of positive work-life experiences such as experience of creativity training, starting an educational course and being promoted to a leadership position, would result in greater requirements to display or engage in creative style preferences. In particular, creativity training often focuses on developing skills divergent thinking with an aim of producing more and varied ideas (Baer, 2016) – therefore this new knowledge and experience may present new/increased requirements or expectations for an individual to engage in typical ‘Stimulator behaviour’ and subsequently increase their stated preference for this style. The same could be said of the Selector creative style preference increasing following the start of an educational course, given the links between the Selector creative style and conscientiousness, and the already discussed findings of conscientiousness increasing after starting an educational course due to the enhanced requirement to display motivation, goal-achievement, prioritisation, structure and decision making. Finally, the Supporter creative style preference includes a strong focus on enabling and improving others, behaviours which are synonymous with good leadership – therefore, being promoted to a leadership position and the associated enhanced need or requirement to focus more on others, their development and their performance, would enable an increase in the Supporter creative style preference of an individual.

***Hypothesis 4f - There will be a significant increase in Stimulator creative style following experience of creativity training in the preceding six months.***

***Hypothesis 4g - There will be a significant increase in Selector creative style following experience of starting an educational course in the preceding six months.***

***Hypothesis 4h - There will be a significant increase in Supporter creative style following experience of being promoted to a leadership position in the preceding six months.***

## **4.2. Methodology**

### **4.2.1. Study Methodology**

In addressing *Hypothesis 1 - The Creative ID measure of creative style fits a five-factor model structure aligning to the posited Stimulator, Spotter, Sculptor, Selector and Supporter dimensions*, we must first establish a suitable process for assessing the robustness of a psychometric measure. This involves establishing the factor structure of the measure and its reliability – with the ultimate aim of conducting research with a measure that can be relied upon to measure in practice what it sets out to theoretically – demonstrating evidence of structural validity.

In looking to establish the measure of creative style’s factor structure, firstly a confirmatory factor analysis (CFA) process is utilised – this method was chosen due to the previous research into the tool and the belief that there was a suitable theoretical structure behind the chosen items. The CFA is

therefore used to assess how well the observed data fit the proposed 5-factor creative style model. Based on the fit statistics provided by the CFA, should these not be deemed adequate, would then be appropriate to utilise a process of exploratory factor analysis (EFA). The purpose of EFA is to determine how many factors the observed data converge to before deciding how many factors (and indeed questionnaire items) to keep – put simply, the data is analysed to determine which individual questions hold together best, indicating that they likely measure a related construct. In the case of the Creative ID, it would be expected that all items designed to measure ‘Stimulating’ would be answered similarly by participants, therefore indicating a ‘Stimulator’ factor which is distinct from the other four factors measured by the tool. The factor loadings of each item onto the underlying latent factor can be determined, with a benchmark for inclusion of  $>.4$  on the primary factor  $<.3$  on any additional factors (i.e. minimising cross-loading across factors) (Ford et al., 1986). Taking these benchmarks into account, alongside the theoretical rationale of the measure itself, decisions can be made to remove particular items from the measure to improve the factor structure and overall model fit of the tool. At this point the reliability of the measure is also considered, with Cronbach’s Alpha used as a measure to assess the internal scale reliability of each factor – the benchmark of acceptability for this measure is generally considered to be  $>.7$  (Nunnally, 1978) which would indicate a suitable correlation between the items as a standalone factor of measurement.

Then a further CFA is involved to establish how well the observed data fits the specified factor model identified in the EFA process. Given that the CFA model is derived from the EFA process, these two steps must be conducted on separate data samples. The purpose of this process is to determine how closely the observed data fits the hypothesised factor-structure model, and also to determine how far away the observed data is from fitting a zero-structure or unspecified model (Jackson et al., 2009). This can be determined through fit indices such as the Standardized Root Mean Residual (SRMR) and Root Mean Square Error of Approximation (RMSEA) where values of  $<.1$  and  $<.08$  respectively are considered a good fit to the specified model (Hooper et al., 2008); also, Comparative Fit Index (CFI) and Tucker-Lewis Index (TLI) or Non-Normed Fit Index (NNFI) where values  $>.9$  are considered a good fit to the specified model (Hooper et al., 2008). A chi-squared analysis is also often used as a measure of model fit in CFA, however, this statistic is sensitive to sample size and with samples greater than 400 (which is the case in the current research) will usually return a significant p value despite other measures indicating a poor model fit (Hooper et al., 2008). Therefore, the chi-squared analysis will not be given substantial consideration for the current research. In terms of the participant sample required to obtain a suitable level of statistical power in this analysis, the ‘MBESS’ package for R (Kelley & Lai, 2014), as outlined by Kelly & Lai (2018), indicates that in rejecting RMSEA values of  $>.08$ , with

an anticipated RMSEA of approximately .05 and statistical power of .8 – an estimated sample size of 257 would be required. Manipulating the statistical power to .9 and raising the expected RMSEA value to the less desirable .07 increases the required sample size to 2,225. Each of these estimated requirements are achieved by the participant sample sizes of the current research from the existing historical data alone.

In addressing Hypotheses 2a-2e the convergent validity of the Creative ID measure is explored. Construct validity determines how well the measures of creative style align (or not) to established measures of personality to determine how well defined the creative style factors are. Mean scale scores for creative styles and personality traits will be used, with correlation analyses utilised to explore the relationships. A correlation of  $>.7$  would be considered a strong correlation. The research will look to establish predictive validity for the creative style measure, in this case, this refers to how well creative style predicts creative/innovative performance – this is established through taking mean scores of the creative style preferences (one score for each of the five creative styles), as well as mean scores of self-report creative/innovative performance (one score for performance at each stage of the creative/innovative process) – correlation analyses will again be utilised before using linear regression to explore where an individual's creative style accounts for a significant amount of variance in their creative/innovative performance. In terms of the required sample size for this analysis to achieve a satisfactory level of statistical power; using the G\*Power tool (Faul et al., 2009) indicates that detection of an estimated small effect size of 0.1, with 5 predictor variables (each of the five creative styles) and power of .9, would require a sample size of 171.

This leads on to Hypothesis 3 where it is explored whether creative style accounts for more variance in creative/innovative performance than that which is accounted for by personality measures alone, indicating incremental validity. This will also be determined by linear regression – with control variables entered into the model first, before adding personality traits to see how much variance is explained in creative/innovative performance (and which traits in particular are seen to be significant predictors), before finally adding creative styles into the model to determine how much additional variance, beyond that already accounted for by control variables and personality traits, can be accounted for by the creative styles. Also, the significance of individual creative styles will be addressed as part of the model. Structural Equation Modelling (SEM) was considered as the method of analysis for these calculations due to the more rigorous nature of this method compared to linear regression, building upon the analysis from the CFA process previously completed and using the identified latent factors and established model structure in the analyses. However, SEM requires a

certain sample size to be considered suitable – in determining whether a sample size is suitable, various sources state contradictory or inconsistent guidance which suggests that a simple cut-off is not appropriate, and the sample size depends heavily on the nature of the data and the complexity of the models being tested. A common rule of thumb is that there should be greater than 300 observations in the sample (Tabachnick & Fidell, 2014), alternatively others state a rule of 20 observations per variable in the model (Kline, 2016), others recommend online tools which help to clarify a required sample size based on the number of variables in the model and the anticipated effect size.

For the current research, a time-separated study design was used (detailed in section 4.2.1) – comprised of two time points, six months apart. When considering the appropriate statistical strategy for such a design, the lowest number of participants at any one time point must be taken into account; in this case there were a total of 303 participants at time 2, though not all participants completed the entire survey so there are some dependent variables which have less than 300 responses implying that this data would not be suitable for SEM. In terms of the 20 observations per variable rule, the models analysed include five creative styles and five personality traits, as well as a relevant control variables totalling 11 variables – this implies a required sample size of 220, making the current data just about suitable for SEM. Finally, an online tool (Soper, 2024) suggests that based on 10 latent variables (five creative styles and five personality traits) made up of 42 observed variables (the items used to measure them) the sample would need to be over 400 in order to detect an effect size of  $d = 0.2$ , which is considered a small to medium effect size (Westland 2010). Given the nature of this research is relatively untested, it is difficult to predict the effect size that needs to be detected, should the effect size be small (0.1), the suggestion is that the sample size would need to be over 2000. Based on the inconsistency of the guidance in this area, and the fact that the current dataset would be considered either unsuitable, or borderline based on the guidance available, the decision was made not to proceed with SEM, and to utilise linear regression instead.

In addressing Hypotheses 4a-4h – all of which relate to the changeability of creative style over time, data are required from the same participants at multiple time points. The chosen study design for this research was to have two timepoints, six months apart. This is in contrast to much of the research into the changeability of traits over time, with those methodologies are much lengthier, often spanning at least three years, sometimes up to nine years (Boyce et al., 2015; Leikas & Salmela-Aro, 2014; Wu, 2016; Wu et al., 2020). It is recognised that there are limitations to having a relatively short timespan of six months for a time-separated study, and indeed just two timepoints – these limitations are



addressed in depth as part of the discussion chapter (section 4.5). The rationale behind the chosen methodology is based upon three factors: participant demands, budgetary constraints, and time constraints.

Firstly, participant demands – as covered in the next section, the original data collection plan was to utilise existing business contacts and gain access to organisations directly. This meant that data collection was reliant upon relatively senior individuals within organisations not only taking the time to participate in the research themselves, but also to make the necessary arrangements and introductions for the research to be distributed around their organisations. Being conscious of people's time, and this impacting upon their motivation to participate, the decision was made to make participation in the research as 'attractive' as possible in an effort to maximise participant numbers and minimise attrition rates over time. Therefore, participation at just two timepoints was requested, with a gap of six months between which was considered a long enough time that people could have the opportunity to experience the work-life events that were of interest to the research, but not too long that the participation felt onerous. It is recognised that a six month time-separated design is relatively short, though has been previously used to explore the impact of work-life events (e.g. workplace strikes; Barling & Milligan, 1987)

Although over 3,000 people were contacted, this resulted in just 33 valid responses. The next approach was to advertise the study publicly on LinkedIn (social business and networking site) which brought about a further 23 responses. Finally, to boost numbers, the research opportunity was posted on Prolific, a platform specialising in finding participants for academic research which involves paying both the platform and the participants for their participation. This resulted in a much higher response, with 303 responses, the maximum possible from the monetary budget which had been set. Secondly, budgetary constraints – although the response rate from Prolific was high, indicating that the participants were motivated to respond and may have been open to a longer (beyond six months) and more detailed (beyond two timepoints) study, there was a limited budget available for participant recruitment and therefore the decision was made to stick with the initial methodology. Thirdly, and finally, time constraints played a part in the study methodology. The initial (less than successful) data collection strategies took time to complete, before embarking on the more successful strategy using Prolific. This ate into the already limited research window afforded by PhD research, and therefore to ensure timely completion of the thesis, as well as staying within the research budget, it was decided not to extend the data collection period or to incorporate further timepoints.

#### 4.2.2. Research sample and data collection

Table 4.3 outlines the sources of data used in the research, and for which purposes. The remainder of this section then details exactly how the data were collected.

*Table 4.3 – Data sources and usage in Study 1*

	Historical data	New data time 1	New data time 2
N	2,785	411	303
Hypothesis 1	X	X	
Hypotheses 2-4		X	X

##### **‘Historical data’**

Historical data already available, provided by the Creative ID’s founding organisation Creative Creatures, was utilised for these analyses. This sample consisted of 2,785 participants which completed the Creative ID measure between 2013 and 2021, all responses were collected via online survey as part of the general business activities of the organisation, with consent given by the participants for their data to be used for research purposes. For clarity, none of these data had been used as part of the previous Masters level research projects conducted between 2009 and 2011, nor were the data used to assess the factor structure of the latest version of the tool in 2012 (Birdi) – this dataset of 2,785 participants had not been used in any previous research of any kind.

As part of the current research, these data were used for the EFA and CFA in establishing the factor structure of the Creative ID tool (Hypothesis 1). When these responses were provided, they were not collected alongside personality or performance data, and were not submitted over multiple timepoints so would not be appropriate for use in exploring any additional hypotheses. All responses were provided using the latest version of the Creative ID tool (version 4), the same version used throughout all new research presented in this thesis.

##### **‘New data time 1’**

New data were required to explore Hypotheses 2-4 and were collected in three ways: firstly, through directly contacting existing contacts of Creative Creatures and asking for their participation; secondly, through advertising the opportunity to participate publicly on LinkedIn; thirdly, through advertising the opportunity on Prolific. All data were collected via online survey, the specific measures included in the survey are outlined in (section 4.2.3) with a copy of the full survey included in Appendix 3. The eligibility criteria for these participants stated that they are adults, currently in employment and with

a suitable level of fluency in English in order to fully comprehend the survey items. The stance of this research in stating that everybody is creative in some way and that creative style is relevant to all industries and job roles ensures that no further restrictions on participation were required. Each stage of collecting data (firstly direct contacts, then LinkedIn, then Prolific) was implemented due to a lower than expected response rate to the previous stage of data collection. The Prolific participant recruitment platform provided an extra level of uncertainty regarding the quality of the data received – given that none of these people were known by, connected to, or directly approached by the research team; additional safeguards were implemented in an attempt to ensure the quality of the data received. This included an attention check question *“I am paying attention (select mostly disagree to show you're still reading these questions properly)”*, a check to see if the participant had selected the same response for every single item, and a time check whereby participants should spend at least 5 minutes on the questionnaire in total (the average completion time was 17 minutes). Failure on any of these safeguards would result in the participant’s data being discarded from the research and their payment withheld. This process resulted in 42 submissions being rejected (10.56%). In total, following the rejection of poor responses, this sample consisted of 411 participants (23 direct contacts, 33 through LinkedIn, 355 through Prolific) who completed the Creative ID measure in 2022. 50.7% of the respondents were male (48.8% female) with an age range of 19-70 years (mean 35.47). The most common countries of work being South Africa, Portugal and the UK (20.7%, 16.8% and 14.4%). 42.3% of respondents had reached degree level education, and 33.1% a Masters degree. All respondents were in employment at the time of their participation, these employment positions range in industry, department and organisation with 46.7% in a managerial/leadership position – the majority (56.4%) had been employed in their current organisation for 4 years or fewer, and in their current role (58.4%) for 3 years or fewer.

### **‘New data time 2’**

Following the ‘new data time 1’ data collection process outlined above, the process was repeated six months later. All respondents at time 1 had given permission to be contacted for a follow-up survey at time 2 – each of these respondents was sent the follow-up either by email, or through the Prolific system, whichever method of contact matched their time 1 response. From the 411 participants who provided valid data at time 1, 303 provided valid, matched responses at time 2 indicating a 26.3% attrition rate.

### Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA)

Taking the two methods of data collection discussed above – ‘historical data’ (N=2,785) and ‘new data time 1’ (N=411) – this formed a combined data set of 3,196 participants with which to conduct the EFA and CFA analyses (addressing Hypothesis 1). These data were collected between 2013 and 2022, 58% of the respondents were female (41.8% male) with an age range of 18-75 years (mean 34.81). The most common countries of work being the UK, USA and Netherlands (24.9%, 10% and 5.3%). 30.1% of respondents had reached degree level education, and 29% a Masters degree. All respondents were in employment at the time of their participation, these employment positions range in industry, department and organisation with 43.3% in a managerial/leadership position – the majority (55.9%) had been employed in their current organisation for 3 years or fewer, and in their current role (62.2%) for 2 years or fewer. A random 50% sample of this dataset was used for the EFA, followed by the remaining 50% for the CFA. These data had not been used for any previous academic research, nor analysed for factor analysis purposes before.

#### 4.2.3. Measures

The measures used in the surveys are outlined below and listed in full as part of Appendix 3 with Table 2 providing an overview of the key scales included in each phase of data collection.

*Table 4.4 – Measures used in different data sources contributing to Study 1*

	Historical data	New data time 1	New data time 2
Creative style (Stimulator, Spotter, Sculptor, Selector, Supporter)	X	X	X
Personality (Openness, Conscientiousness, Extraversion, Agreeableness, Neuroticism)		X	
Creative/innovative performance (Task presentation, Preparation, Idea Generation, Idea Validation, Outcome Assessment)		X	X
Work-life experiences (Redundancy, unemployment, promotion to leadership, stating			X

educational course, creativity training)			
Demographics	X	X	X

### *Creative Style*

The chosen measure of creative style for the research was the Creative ID tool (version 4). As discussed throughout this thesis, this is the tool which has been identified as a measure which could address the of limitations associated with alternative measures of creative style. The tool consists of 40 items measured on a 6-point Likert scale ranging from ‘completely disagree’ to ‘completely agree’. The tool measures five creative styles:

- Stimulator creative style (8 items) – e.g. “Ideas are always popping into my head.”
- Spotter creative style (8 items) – e.g. “I can easily combine seemingly unrelated pieces of information to generate a new idea.”
- Sculptor creative style (8 items) – e.g. “I take the lead in making ideas tangible and concrete.”
- Selector creative style (8 items) – e.g. “I can list the pros and cons of an idea easily.”
- Supporter creative style (8 items) – e.g. “I offer support and guidance when a team member hits a barrier on a project.”

### *Personality*

Personality was measured by a measure of the ‘Big Five’ measure of personality traits. This particular measure of personality known as the Big Five Inventory (BFI) comes from John and Srivastava’s (1999) paper which assesses three different measures of the ‘big five’ personality traits - BFI, Trait Descriptive Adjectives (TDA) and NEO Five Factor Inventory (NEO) - which, through confirmatory factor analysis, found the standardised validity coefficients of the BFI to be higher than the other two measures in four of the five traits measures (range .90 to .94), as well as the overall mean (.92). The tool consists of 44 items measured on a 5-point Likert scale ranging from ‘strongly disagree’ to ‘strongly agree’, with a number if the items reverse-scored. The tool measures five personality traits:

- Openness to experience (10 items,  $\alpha=.756$ ) – e.g. “I see myself as someone who is curious about many different things.”
- Conscientiousness (9 items,  $\alpha=.808$ ) – e.g. “I see myself as someone who does a thorough job.”
- Extraversion (8 items,  $\alpha=.850$ ) – e.g. “I see myself as someone who is talkative.”
- Agreeableness (9 items,  $\alpha=.779$ ) – e.g. “I see myself as someone who is helpful and unselfish with others.”

- Neuroticism (8 items,  $\alpha=.862$ ) – e.g. “I see myself as someone who can be tense.”

*Note: reliability statistics stated above based on data utilised in this research, not from previously published figures.*

The reliability and factor structure of this measure had been assessed in previous published literature, both in English and other European languages (Denissen et al., 2008; Fossati et al., 2011; John et al., 2012; John & Srivastava, 1999). Given the strength of publications of this scale, the full 44-item measure as previously published is retained for the current research.

#### *Creative/Innovative Performance*

Creative/innovative performance was measured using subjective self-report measures. This decision was seen as the most appropriate and generalisable method for collecting performance related data for this study. Objective measures of performance in an organisation can be difficult to standardise and generalise due to the differing nature of the roles and industries in which the participants work. Some roles are predisposed to coming up with a lot of ideas, other with implementing a lot of ideas and initiatives and measuring creative/innovative performance objectively in this way would bias the results toward the stereotypical “creative” industries and in some ways belittle the achievements of those achieving everyday creativity which is relevant to their own roles. An alternative method of obtaining objective performance data would be to set a task as part of the survey, where participants are required to come up with as many ideas as possible for a particular topic – however, including such tasks seems arbitrary and a skill likely to be unrelated to the majority of participant occupations, so it could be argued that this would not be a relevant measure of occupational performance. Therefore, the measures chosen to assess creative/innovative performance in the current research were ones which are worded more generically and be applied to each individual’s context as required to reflect their way of working.

The measure used is a combination of items from papers published by Binnewies et al. (2007), de Jong and den Hartog (2010), and Scott and Bruce (Scott & Bruce, 1995) with some adaptation of language where deemed appropriate. A table outlining the changes in language from the original scales, to those used in the current research can be found in Appendix 3. The reason for selecting such scales is that these measures have been aligned to Amabile and Pratt’s stages of the creativity and innovation process (Amabile, 1988; Amabile & Pratt, 2016) – a theory that goes beyond simply looking at idea generation and idea implementation, and looks in greater detail at the stages required to take something from an initial starting point through to a successful implementation. In particular, the

work of Binnewies et al., de Jong and den Hartog align to the creativity/innovation stages of; task presentation, preparation, idea generation and idea validation. With Scott and Bruce's work on rational decision making aligning with the final stage of the creativity/innovation process – outcome assessment. It is recognised that although these items have been validated in previous research, some of the items have been adapted for the current research, so appropriate analyses of each scale's respective inter-item reliability are discussed as part of the research results. The reasoning behind merging a number of performance scales from different sources for the purpose of the current research is that there was no discoverable single scale in the literature which encompassed all five of the creativity/innovation stages of interest: task presentation, preparation, idea generation, idea validation and outcome assessment. Therefore, an amalgamation of the scales used in the studies previously referenced (Binnewies et al., 2007; de Jong & den Hartog, 2010; Scott & Bruce, 1995) was used to ensure all five stages were measured.

The research utilised 17 items measured on a 5-point Likert scale of 'never', 'rarely', 'sometimes', 'often' and 'always'. The items aim to measure the five stages of creativity and innovation as outlined by Amabile and Pratt (2016):

- Task Presentation (3 items,  $\alpha=.688$ ) – e.g. "I wonder how things can be improved."  
This stage is concerned with identifying creative and innovative opportunities, wondering how things can be improved and determining which projects to actually pursue.
- Preparation (3 items,  $\alpha=.574$ ) – e.g. "I easily identify the resources needed to make a project happen."  
This stage is concerned with preparing to embark on the creative endeavour – identifying the required resources, gathering information and considering what is required for success.
- Idea Generation (4 items,  $\alpha=.777$ ) – e.g. "I find new approaches to execute tasks."  
This stage is about coming up with new ideas and new approaches to problems and tasks – this is very much about quantity of ideas and divergent thinking.
- Idea Validation (3 items,  $\alpha=.670$ ) – e.g. "I carefully balance the options available before deciding on the way forward."  
This stage is more concerned with the quality of ideas, objectively assessing the ideas that are available to determine their suitability and ultimately using convergent thinking to decide on how to progress with the project.
- Outcome Assessment (4 items,  $\alpha=.657$ ) – e.g. "When making decisions, I consider the various options in the context of a specific goal."

This stage is about decision making and determining the success of a project – this involves objectively reviewing and assessing the progress made against the desired outcomes; before making decisions on what needs to be done next based on this assessment.

Using the data collected in this study, the reliability statistics for this measure were a concern, especially that of the Preparation items ( $\alpha=.574$ ). Additionally, the measure does not meet the threshold to indicate a good fit to the proposed five-factor model of performance, achieving model fit indices of CFI = .893; RMSEA = .070; SRMR = .068. Furthermore, an EFA analysis indicated that one of the Idea Generation items cross loaded onto multiple factors, and that the overall factor structure would benefit from the removal of the Preparation factor entirely.

This decision to remove 4 items from the measure (1 relating to Idea Generation and 3 relating to Preparation) results in a revised 13 item measure for use in the current research consisting of:

- Task Presentation (3 items,  $\alpha=.69$ )
- Idea Generation (3 items,  $\alpha=.78$ )
- Idea Validation (3 items,  $\alpha=.67$ )
- Outcome Assessment (4 items,  $\alpha=.66$ )

This measure achieves acceptable outcomes in terms of model fit indices (CFI = .920; RMSEA = .071; SRMR = .062) which are stronger than any other identifiable factor structures, including a 13-item single-factor scale to represent creative/innovative performance ( $\alpha=.85$ ; CFI = .746; RMSEA = .120; SRMR = .091). As such, the revised 13 item measure was deemed to be a satisfactory measure of performance for use in the current research.

#### *Work-life events*

As explained in greater detail in *section 4.1.3*, work-related items were adapted from the broader scale used by Kandler (2012) which addresses a broader spectrum of life events both in and out of the workplace. At Time 2 of the current research, participants were asked which work-life events they had experienced – this occurred six months after Time 1. Therefore, the question was phrased ‘In the last 6 months I have...’ with tick box options to select as many options as appropriate (coded 1=Yes; 0=No). Participants were asked whether they had experienced five different work-life events; three of which could be considered positive experiences:

- Started a new educational course
- Experienced creativity training
- Been promoted to a leadership position



As well as two negative work-life events:

- Experienced redundancy
- Had more than three months of involuntary unemployment.

### *Demographics*

Additional demographic information was collected in order to act as additional variables to control for when exploring relationships between the main constructs of interest; creative style, personality and creative/innovative performance. These include: gender (with dummy variables constructed coded 1 = male, 0 = female. The survey accommodated responses for 'Other' and 'Prefer not to say' – with just 2 responses to these options dummy variables were not created, with these responses treated as missing data), age (years), organisational tenure (years), role tenure (years) leadership responsibility (1 = Yes; 0 = No) and size of team responsible for.

Full measures used in the survey can be found in Appendix 3.

## **4.3. Results: Research Question 1**

### **4.3.1. Statistical Approach**

The following chapter outlines the results in relation to Study 1.

Firstly, this addresses the factor structure and reliability of the Creative ID measure of creative style, utilising EFA and CFA to assess the factor structure and reliability analyses to assess each scale within the measure (Hypothesis 1). Secondly correlations between creative styles and personality traits were established, before also establishing correlations between creative styles and performance measures (Hypotheses 2a-2j). Regression was then utilised to explore the both the explanatory power of creative styles in predicting performance (Hypotheses 2a-2j), and also to determine the amount of variance in performance accounted for by creative style whilst controlling for personality (Hypothesis 3).

### **4.3.2. First Confirmatory Factor Analysis (CFA) of the creative style measure**

The purpose of conducting a confirmatory factor analysis (CFA) is to determine how closely the observed data fit this hypothesised factor-structure model, and also to determine how far away the observed data are from fitting a zero-structure or unspecified model (Jackson et al., 2009).

R software, specifically the RStudio application (Posit Team, 2023) using the 'lavaan' package (Rosseel, 2012), was used to perform a CFA using maximum likelihood estimation on the dataset (N = 3,154; detailed in Table 4.3). A five-factor model was hypothesised to be confirmed in the measurement of the model, using the full 40-item measure. The comparative fit index (CFI) = .813; Root Mean Square Error of Approximation (RMSEA) = .058 and Standardized Root Mean Square Residual (SRMR) = .054. The RMSEA and SRMR values (<.08 and <.1 respectively) indicate a good fit between the proposed model and the observed data based on generally accepted benchmarks (Hooper et al., 2008), however the CFI (<.9) does not and therefore further investigation into the measure is required.

- Factor 1 (Stimulator creative style) was comprised of 8 items with standardised factor loadings from .487 to .769.
- Factor 2 (Spotter creative style) was comprised of 8 items with standardised factor loadings from .392 to .643.
- Factor 3 (Sculptor creative style) was comprised of 8 items with standardised factor loadings from .474 to .645.
- Factor 4 (Selector creative style) was comprised of 8 items with standardised factor loadings from .384 to .640.
- Factor 5 (Supporter creative style) was comprised of 8 items with standardised factor loadings from .454 to .665.

#### **4.3.3. Exploratory Factor Analysis (EFA) of the creative style measure**

Using SPSS software, an EFA was conducted on a 50% random sample of the dataset (N = 1,600; detailed in Table 4.3) to explore whether firstly, the best fit for the data is a five-factor model given the CFA fit indices did not indicate an adequate fit to the model; and secondly, whether any weaker loading items could be deleted to further improve the overall model fit. The expected model fit was that there would be a five-factor model, with each factor including 8 items relating to a distinct creative style.

Reliability analyses indicate that the inter-item reliability of each of the five proposed factors are:

- Stimulator (8 items,  $\alpha=.822$ )
- Spotter (8 items,  $\alpha=.773$ )
- Sculptor (8 items,  $\alpha=.789$ )
- Selector (8 items,  $\alpha=.793$ )

- Supporter (8 items,  $\alpha=.793$ )

This indicates a suitable level of reliability (Nunnally, 1978) within the factors identified. Furthermore, this analysis indicated that there were no items which would improve the alpha value of the scale should it be removed.

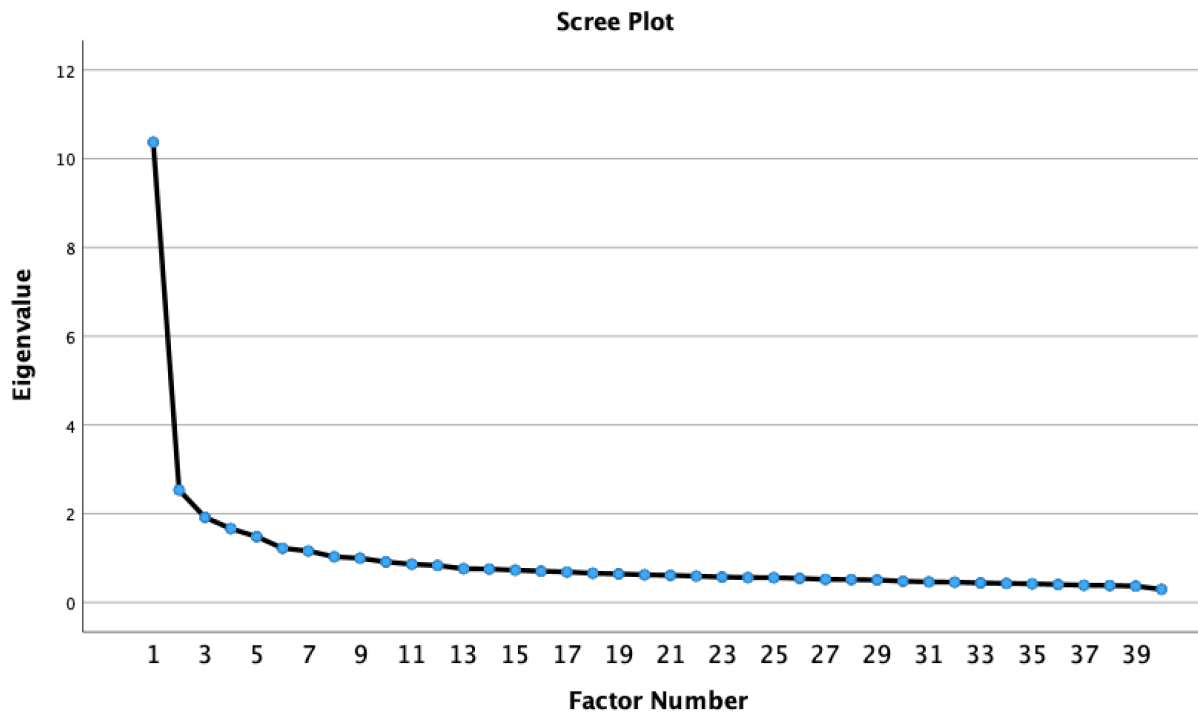
However, conducting an EFA using Principal Axis Factoring and Direct Oblimin rotation suggests, based on an Eigenvalue of  $>1$ , that a seven-factor solution best fits the data with this solution accounting for 50.86% of the variance in the data. However, it is acknowledged that this Eigenvalue rule of thumb could be considered a rather arbitrary cut-off and is best considered alongside other methods to determine how many factors to proceed with (Mulaik, 2018). In this case it can be seen from the scree plot that the point at which the line starts to become more horizontal (i.e. indicating the point at which additional factors are adding less value and accounting for less additional variance, see Figure 4.1) could be considered to be the 5-, 6- or 7-factor mark. Furthermore, when considering this from a theoretical viewpoint, rather than making solely statistically driven decisions, there are five interpretable and theoretically supported factors clearly visible in the pattern matrix (Table 4.5) with other items around these either cross-loading on to multiple factors or loading onto spurious factors which cannot be logically justified or defined. Based on this insight, it was decided to run the EFA again with the full 40 items, forcing a 5-factor solution – however, this did not bring about a clearer structure than the 7-factor solution (Table 4.6).

Following this outcome, a systematic approach of removing items (from the original 7-factor solution, that being the most interpretable initial solution) was conducted with the aim of finding an acceptable factor solution based on the criteria outlined in the work of Irwing et al. (2024). The following criteria were considered:

- Removal of items which fail to load on any factor, or have a primary factor loading of  $<.3$
- Each factor should be identified by at least three items with loadings  $>.3$  (spurious factors)
- Removal of items with cross-factor loadings of approximately equal magnitude
- Ensuring that the theoretical coherence of each defined factor is retained – this includes the consideration of re-introducing previously removed items should this be required to ensure that the defined factor is adequately represented by the range of items

This process resulted in the removal of 15 items, leaving 25 in the measure.

Figure 4.1 – Scree plot from the Exploratory Factor Analysis of the 40-item Creative ID measure



Rerunning the EFA with the remaining 25 items resulted in a five-factor solution (detailed in Table 4.7), though 5 items remained which did not load onto a factor at a level of  $>.4$ . Further removal of 5 low-loading items and rerunning the EFA with the remaining 20 items achieves a suitable five-factor structure, with 4 items per factor, accounting for 56.32% of the total variance with just 1 item not achieving a factor loading of  $>.4$  (detailed in Table 4.8).

Reliability analyses indicate that the inter-item reliability of each of the five proposed factors in the revised 20-item measure are:

- Stimulator (4 items,  $\alpha=.704$ )
- Spotter (4 items,  $\alpha=.671$ )
- Sculptor (4 items,  $\alpha=.690$ )
- Selector (4 items,  $\alpha=.744$ )
- Supporter (4 items,  $\alpha=.725$ )

However, although this provides a relatively neat solution from a statistical perspective (acknowledging that some of the inter-item reliability items are lower than desired) that is likely to perform well in a CFA process, when considering the items themselves against the creative style definitions, there is an area of mismatch that should not be overlooked. In particular, the Sculptor creative style is defined as: *‘developing and building upon existing ideas, making complex things simple, tangible and concrete’*. This style preference therefore encompasses an element of clear and influential communication to achieve the preference of making complex things simple (to others), yet it would be argued that this is done within the context of developing and building upon the ideas of others. It is this development of ideas that would be seen as the core characteristic of the creative style and should therefore be reflected in the items of measurement. When considering the four items relating to the Sculptor creative style suggested for inclusion by the EFA process, all of them relate to communication, with none focusing on the development of ideas. As DeVellis advises “With all factor analytic approaches, common sense is needed to make the best decisions. The analyses are merely guides to the decision-making process and evidence in support of those decisions. They should not, in my judgment, entirely replace investigator decision making.” (2017, p185). Therefore, the decision was made to explore the possibility of exchanging the four items which ‘hold together’ well, and replace these with the alternative items previously disregarded from the tool as they, theoretically, provide a better balance in measuring what the tool sets out to measure in regard to the Sculptor creative style. This also aligns to Irwing et al.’s (2024) guidance of ensuring the retention of theoretical coherence – in this case selectively choosing to reintroduce previously removed items based on theoretical, rather than statistical, rationale.

EFA indicates that replacing the Sculptor items with three of the previously disregarded Sculptor items results in a clear five-factor solution, including three items with a factor loading of  $<.4$  (detailed in Table 4.9). The inter-item reliability of each of the five proposed factors in this revised 19-item measure are (all  $N=1600$ ):

- Stimulator (4 items,  $\alpha=.70$ )
- Spotter (4 items,  $\alpha=.68$ )
- Sculptor (3 items,  $\alpha=.60$ )
- Selector (4 items,  $\alpha=.75$ )
- Supporter (4 items,  $\alpha=.72$ )

Though it is recognised that not all of these scales achieve the desired threshold of  $>.7$ , greater alpha values are more easily achieved (regardless of the actual reliability) when scales have a large number

of items (Cortina, 1993) – as Sijtsma (2009) notes, alpha values could be considered a lower-bound for reliability rather than an accurate estimate, and when considering the internal consistency of a scale the factor structure is important, and using alpha values to assess this may be an oversimplification. Therefore, we can take some reassurance in the robustness of the measure given the CFA results which are to be discussed in the next section.

Table 4.5 – Exploratory Factor Analysis of full 40-item Creative ID measure

	Factor						
	1	2	3	4	5	6	7
*STIM1.1 I tend to open up new avenues of thinking rather than closing things down		-0.366					
STIM1.2 I am always able to come up with lots of ideas on the spot		-0.545					
STIM1.3 My inspiration for ideas comes from lots of different sources		-0.439					
STIM1.4 I generate more ideas than I can realistically take forward at any one time		-0.674					
STIM1.5 I am never short of ideas		-0.689					
STIM1.6 My approach to overcoming challenges is usually quite different to that of other people		-0.413					
STIM1.7 I have an insatiable curiosity about most things around me		-0.476					
STIM1.8 Ideas are always popping into my head		-0.797					
**SPOT1.1 I easily identify potential ideas from only small amounts of information	-0.311						0.407
*SPOT1.2 I am good at seeing new opportunities							0.387
SPOT1.3 I can easily combine seemingly unrelated pieces of information to generate a new idea							0.408
SPOT1.4 I am able to discover the beginnings of powerful ideas amongst all the rubbish							0.566
SPOT1.5 I can easily synthesise large amounts of information to spot the gem of an idea							0.529
*SPOT1.6 I often rely on my intuition when generating solutions							
SPOT1.7 I am usually the first to see the potential in a new idea in its early stages							0.477
***SPOT1.8 I am able to imagine how an initial thought can grow into a big idea			-0.347				0.349
**SCULPT1.1 It is easy for me to develop half-formed ideas further	-0.403				0.348		
SCULPT1.2 I am good at communicating complex ideas in a simple way					0.638		
SCULPT1.3 I articulate my ideas to others using rich and colourful language					0.494		
SCULPT1.4 I take the lead in making ideas tangible and concrete					0.400		
*SCULPT1.5 I easily articulate ideas in ways other than words alone					0.346		
SCULPT1.6 I am good at shaping a story to sell a point of view as strongly as possible					0.540		
**SCULPT1.7 I am good at building on an existing idea to make it even better and stronger						0.451	
SCULPT1.8 I naturally communicate my vision of the idea in a way others find easy to understand					0.635		
SELECT1.1 I am good at asking the right questions to separate good from bad ideas				-0.629			
SELECT1.2 It is easy for me to work with a variety of information and data when making decisions				-0.485			

SELECT1.3 I am good at picking the right idea to take forward				-0.541			
SELECT1.4 I can list the pros and cons of an idea easily				-0.592			
**SELECT1.5 When making decisions, I use hard facts as well as my intuition				-0.323		0.372	
*SELECT1.6 I consider the commercial impact of potential ideas before choosing the best one							
**SELECT1.7 I always review my decisions as it helps me make better ones in the future				-0.365		0.476	
*SELECT1.8 I can make a good argument for selecting which ideas to take forward				-0.341			
*SUPP1.1 I am good at facilitating discussions between individuals to help them generate new ideas				-0.353			
SUPP1.2 When working as a new project team, I take the lead in establishing harmony within the group			-0.573				
*SUPP1.3 When team members have diverse thoughts on a project, I can easily empathise with the different points of view			-0.393				
**SUPP1.4 I offer support and guidance when a team member hits a barrier on a project						0.343	
SUPP1.5 When brainstorming ideas, I am the one that gets the team back on track if the group dynamics are not working			-0.423				
SUPP1.6 I encourage building and cross-fertilisation of ideas within the team			-0.609				
SUPP1.7 I ask the right questions needed to get the best out of others							
SUPP1.8 I am good at getting a diverse set of people to join together around a common goal			-0.711				

*\*item identified for removal due to low factor loading (<.4)*

*\*\*item identified for removal to eliminate spurious factors*

*\*\*\* item identified for removal due to cross-loading on multiple factors*



Table 4.6 – Exploratory Factor Analysis of full 40-item Creative ID measure with a forced 5-factor solution

	Factor				
	1	2	3	4	5
STIM1.1 I tend to open up new avenues of thinking rather than closing things down		-0.349			
STIM1.2 I am always able to come up with lots of ideas on the spot		-0.521		-0.315	
STIM1.3 My inspiration for ideas comes from lots of different sources		-0.424			
STIM1.4 I generate more ideas than I can realistically take forward at any one time		-0.638			
STIM1.5 I am never short of ideas		-0.689			
STIM1.6 My approach to overcoming challenges is usually quite different to that of other people		-0.416			
STIM1.7 I have an insatiable curiosity about most things around me		-0.481			
STIM1.8 Ideas are always popping into my head		-0.806			
SPOT1.1 I easily identify potential ideas from only small amounts of information				-0.401	
SPOT1.2 I am good at seeing new opportunities			0.322	-0.344	
SPOT1.3 I can easily combine seemingly unrelated pieces of information to generate a new idea				-0.428	
SPOT1.4 I am able to discover the beginnings of powerful ideas amongst all the rubbish			0.443	-0.399	
SPOT1.5 I can easily synthesise large amounts of information to spot the gem of an idea			0.502		
SPOT1.6 I often rely on my intuition when generating solutions			0.324		
SPOT1.7 I am usually the first to see the potential in a new idea in its early stages			0.498		
SPOT1.8 I am able to imagine how an initial thought can grow into a big idea	0.408				
SCULPT1.1 It is easy for me to develop half-formed ideas further					0.421
SCULPT1.2 I am good at communicating complex ideas in a simple way					0.584
SCULPT1.3 I articulate my ideas to others using rich and colourful language					0.503
SCULPT1.4 I take the lead in making ideas tangible and concrete					0.452
SCULPT1.5 I easily articulate ideas in ways other than words alone	0.305				0.340
SCULPT1.6 I am good at shaping a story to sell a point of view as strongly as possible					0.452
SCULPT1.7 I am good at building on an existing idea to make it even better and stronger	0.378				
SCULPT1.8 I naturally communicate my vision of the idea in a way others find easy to understand					0.555
SELECT1.1 I am good at asking the right questions to separate good from bad ideas				-0.577	
SELECT1.2 It is easy for me to work with a variety of information and data when making decisions				-0.521	
SELECT1.3 I am good at picking the right idea to take forward				-0.539	
SELECT1.4 I can list the pros and cons of an idea easily				-0.542	
SELECT1.5 When making decisions, I use hard facts as well as my intuition	0.462				

SELECT1.6 I consider the commercial impact of potential ideas before choosing the best one					
SELECT1.7 I always review my decisions as it helps me make better ones in the future	0.509				
SELECT1.8 I can make a good argument for selecting which ideas to take forward	0.398				
SUPP1.1 I am good at facilitating discussions between individuals to help them generate new ideas				-0.407	
SUPP1.2 When working as a new project team, I take the lead in establishing harmony within the group					0.346
SUPP1.3 When team members have diverse thoughts on a project, I can easily empathise with the different points of view	0.313		-0.332		
SUPP1.4 I offer support and guidance when a team member hits a barrier on a project	0.474				
SUPP1.5 When brainstorming ideas, I am the one that gets the team back on track if the group dynamics are not working	0.352				
SUPP1.6 I encourage building and cross-fertilisation of ideas within the team	0.526				
SUPP1.7 I ask the right questions needed to get the best out of others	0.361				
SUPP1.8 I am good at getting a diverse set of people to join together around a common goal	0.531				0.338

Table 4.7 – Exploratory Factor Analysis of revised 25-item Creative ID measure

	Factor				
	1	2	3	4	5
*STIM1.2 I am always able to come up with lots of ideas on the spot	0.381	-0.468			
STIM1.3 My inspiration for ideas comes from lots of different sources		-0.350			
STIM1.4 I generate more ideas than I can realistically take forward at any one time		-0.572			
*STIM1.5 I am never short of ideas		-0.689			
*STIM1.6 My approach to overcoming challenges is usually quite different to that of other people		-0.393			
STIM1.7 I have an insatiable curiosity about most things around me		-0.464			
STIM1.8 Ideas are always popping into my head		-0.804			
SPOT1.3 I can easily combine seemingly unrelated pieces of information to generate a new idea	0.410			0.338	
SPOT1.4 I am able to discover the beginnings of powerful ideas amongst all the rubbish				0.536	
SPOT1.5 I can easily synthesise large amounts of information to spot the gem of an idea				0.523	
SPOT1.7 I am usually the first to see the potential in a new idea in its early stages				0.509	
SCULPT1.2 I am good at communicating complex ideas in a simple way					-0.671
SCULPT1.3 I articulate my ideas to others using rich and colourful language					-0.446
*SCULPT1.4 I take the lead in making ideas tangible and concrete				0.321	-0.329
SCULPT1.6 I am good at shaping a story to sell a point of view as strongly as possible					-0.484
SCULPT1.8 I naturally communicate my vision of the idea in a way others find easy to understand					-0.604
SELECT1.1 I am good at asking the right questions to separate good from bad ideas	0.595				
SELECT1.2 It is easy for me to work with a variety of information and data when making decisions	0.574				
SELECT1.3 I am good at picking the right idea to take forward	0.564				
SELECT1.4 I can list the pros and cons of an idea easily	0.562				
SUPP1.2 When working as a new project team, I take the lead in establishing harmony within the group			-0.449		
SUPP1.5 When brainstorming ideas, I am the one that gets the team back on track if the group dynamics are not working			-0.477		
SUPP1.6 I encourage building and cross-fertilisation of ideas within the team			-0.610		
*SUPP1.7 I ask the right questions needed to get the best out of others			-0.312		
SUPP1.8 I am good at getting a diverse set of people to join together around a common goal			-0.767		

\*item identified for removal due to low factor loading (<.4)

Table 4.8 – Exploratory Factor Analysis of revised 20-item Creative ID measure

	Factor				
	1	2	3	4	5
STIM1.3 My inspiration for ideas comes from lots of different sources				0.405	
STIM1.4 I generate more ideas than I can realistically take forward at any one time				0.550	
STIM1.7 I have an insatiable curiosity about most things around me				0.526	
STIM1.8 Ideas are always popping into my head				0.670	
SPOT1.3 I can easily combine seemingly unrelated pieces of information to generate a new idea	0.382		0.379		
SPOT1.4 I am able to discover the beginnings of powerful ideas amongst all the rubbish			0.585		
SPOT1.5 I can easily synthesise large amounts of information to spot the gem of an idea			0.542		
SPOT1.7 I am usually the first to see the potential in a new idea in its early stages			0.506		
*SCULPT1.2 I am good at communicating complex ideas in a simple way					-0.602
*SCULPT1.3 I articulate my ideas to others using rich and colourful language			0.302		-0.427
*SCULPT1.6 I am good at shaping a story to sell a point of view as strongly as possible					-0.529
*SCULPT1.8 I naturally communicate my vision of the idea in a way others find easy to understand					-0.661
SELECT1.1 I am good at asking the right questions to separate good from bad ideas	0.632				
SELECT1.2 It is easy for me to work with a variety of information and data when making decisions	0.560				
SELECT1.3 I am good at picking the right idea to take forward	0.562				
SELECT1.4 I can list the pros and cons of an idea easily	0.576				
SUPP1.2 When working as a new project team, I take the lead in establishing harmony within the group		0.464			
SUPP1.5 When brainstorming ideas, I am the one that gets the team back on track if the group dynamics are not working		0.473			
SUPP1.6 I encourage building and cross-fertilisation of ideas within the team		0.602			
SUPP1.8 I am good at getting a diverse set of people to join together around a common goal		0.802			

*\*item identified for removal due to construct definition (<.4)*

Table 4.9 – Exploratory Factor Analysis of revised 19-item Creative ID measure

	Factor				
	1	2	3	4	5
STIM1.3 My inspiration for ideas comes from lots of different sources		-0.398			
STIM1.4 I generate more ideas than I can realistically take forward at any one time		-0.554			
STIM1.7 I have an insatiable curiosity about most things around me		-0.531			
STIM1.8 Ideas are always popping into my head		-0.685			
SPOT1.3 I can easily combine seemingly unrelated pieces of information to generate a new idea				0.397	
SPOT1.4 I am able to discover the beginnings of powerful ideas amongst all the rubbish				0.610	
SPOT1.5 I can easily synthesise large amounts of information to spot the gem of an idea				0.576	
SPOT1.7 I am usually the first to see the potential in a new idea in its early stages				0.465	
SCULPT1.1 It is easy for me to develop half-formed ideas further					0.306
SCULPT1.5 I easily articulate ideas in ways other than words alone					0.314
SCULPT1.7 I am good at building on an existing idea to make it even better and stronger					0.682
SELECT1.1 I am good at asking the right questions to separate good from bad ideas	0.633				
SELECT1.2 It is easy for me to work with a variety of information and data when making decisions	0.549				
SELECT1.3 I am good at picking the right idea to take forward	0.570				
SELECT1.4 I can list the pros and cons of an idea easily	0.602				
SUPP1.2 When working as a new project team, I take the lead in establishing harmony within the group			-0.491		
SUPP1.5 When brainstorming ideas, I am the one that gets the team back on track if the group dynamics are not working			-0.496		
SUPP1.6 I encourage building and cross-fertilisation of ideas within the team			-0.575		
SUPP1.8 I am good at getting a diverse set of people to join together around a common goal			-0.804		

#### **4.3.4. Second Confirmatory Factor Analysis (CFA) of the creative style measure**

The purpose of conducting this confirmatory factor analysis (CFA) is to build upon the exploratory factor analysis (whereby a factor structure was suggested) to determine how closely the observed data fit this hypothesised factor-structure model, and also to determine how far away the observed data are from fitting a zero-structure or unspecified model (Jackson et al., 2009).

R software, specifically the RStudio application (Posit Team, 2023) using the 'lavaan' package (Rosseel, 2012), was used to perform a CFA using maximum likelihood estimation on a 50% random sample of the dataset (N = 1,596; detailed in Table 4.3). A five-factor model was hypothesised to be confirmed in the measurement of the model, using the revised 19-item measure identified from the EFA process. The comparative fit index (CFI) = .917; Root Mean Square Error of Approximation (RMSEA) = .054 and Standardized Root Mean Square Residual (SRMR) = .044. All of which indicate a good fit between the proposed model and the observed data.

- Factor 1 (Stimulator creative style) was comprised of 4 items with standardised factor loadings from .586 to .676.
- Factor 2 (Spotter creative style) was comprised of 4 items with standardised factor loadings from .488 to .664.
- Factor 3 (Sculptor creative style) was comprised of 3 items with standardised factor loadings from .538 to .588.
- Factor 4 (Selector creative style) was comprised of 4 items with standardised factor loadings from .628 to .678.
- Factor 5 (Supporter creative style) was comprised of 4 items with standardised factor loadings from .589 to .720.

In a meta-analysis of research studies which reference factor loadings (Peterson, 2000), it is noted that “researchers appear to use a heuristic based on expertise or intuition when interpreting or evaluating the significance of a factor loading” (2000, p. 264) with Merenda stating that “it seems from the general literature in the social and behavioral sciences that [a threshold factor loading of] 0.30” is the minimum that is generally used when deciding to “accept an item or variable as belonging to a factor or component.” (1997, p. 160) though it is also noted that items at these lower levels should not load to multiple factors to avoid the issue of “complex items” and unsatisfactory structures – this is something addressed as part of the EFA process discussed previously (section 4.3.2).

Table 4.10 – Covariances and descriptive statistics of scales

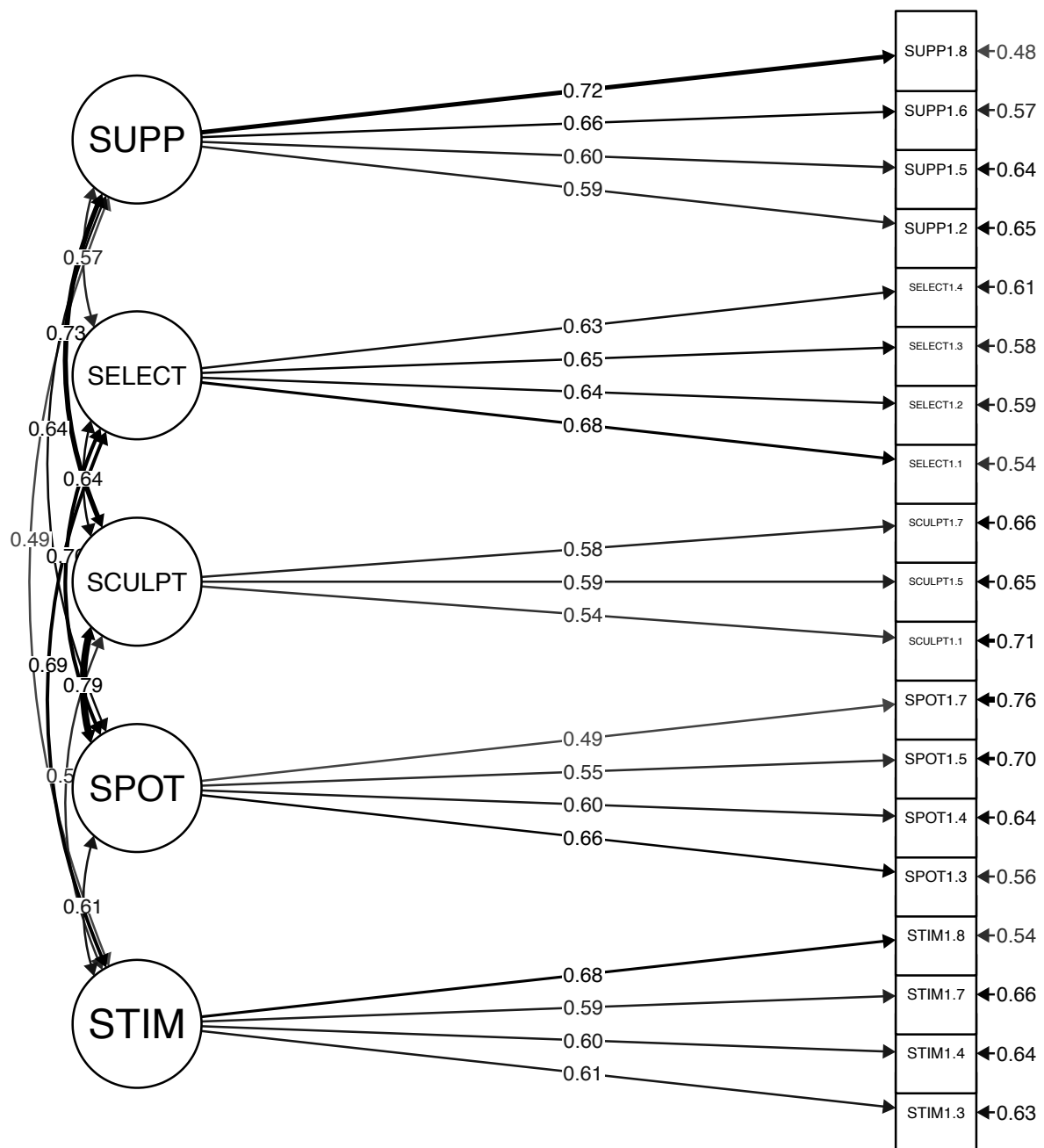
	Stim	Spot	Sculpt	Select	Supp
Stim N=3154 Mean=18.13 SD=3.33	-				
Spot N=3154 Mean=18.40 SD=2.76	.612***	-			
Sculpt N=3154 Mean=18.17 SD=3.04	.557***	.786***	-		
Select N=3154 Mean=18.30 SD=2.86	.695***	.702***	.641***	-	
Supp N=3154 Mean=17.73 SD=3.23	.485***	.641***	.734***	.569***	-

\*\*\*p < .001

Figure 4.2 illustrates the five-factor model resulting from the CFA. Given that all of the factor loadings in this analysis of the revised 19-item measure were at a level of  $>.4$ ; the CFI  $>.9$ ; the RMSEA  $<.08$ ; and the SRMR  $<.1$  (which complies with the generally accepted benchmarks Hooper et al., 2008), therefore, it can be concluded that there is a suitable fit for the five-factor model proposed. Reliability analyses indicate that the inter-item reliability of each of the five proposed factors in the revised 19-item measure are (all N=1596):

- Stimulator (4 items,  $\alpha=.71$ )
- Spotter (4 items,  $\alpha=.66$ )
- Sculptor (3 items,  $\alpha=.60$ )
- Selector (4 items,  $\alpha=.74$ )
- Supporter (4 items,  $\alpha=.73$ )

Figure 4.2 – five-factor model of creative style measure



This model fit is stronger than a single-factor alternative using the 40-item [Cronbach's alpha = .93; CFI = .681; RMSEA = .075; SRMR = .067], a single-factor alternative using the 20-items suggested by the EFA analysis [Cronbach's alpha = .87; CFI = .728; RMSEA = .091; SRMR = .072], or a single-factor alternative using the 19-items final version of the tool for use in the research [Cronbach's alpha = .87;



CFI = .772; RMSEA = .086; SRMR = .066], with no further acceptable model structures suggested by the EFA.

Inter-item reliabilities for the full sample of 3,196 are:

- Stimulator (4 items,  $\alpha=.70$ )
- Spotter (4 items,  $\alpha=.67$ )
- Sculptor (3 items,  $\alpha=.60$ )
- Selector (4 items,  $\alpha=.74$ )
- Supporter (4 items,  $\alpha=.73$ )

It is acknowledged that some of these reliability statistics are lower than would be desired, however the work of Tavakol & Dennick (2011) note that “A low value of alpha could be due to a low number of questions, poor inter-relatedness between items or heterogeneous constructs” (2011, p54). They suggest that looking at the correlations between each item and the total scale score, with any correlations approaching zero indicating items which could be inadequate and considered for removal. In the case of the Spotter and Sculptor items, when looking at their correlations with the respective scale total, coefficients range from .65 to .76. This adds some assurance that the low reliability scores may be simply due to a small number of items in the scale; whilst the CFA output also provides support for the measure in terms of the identified factor structure when assessed against the data collected.

Therefore ***Hypothesis 1 – The Creative ID measure of creative style fits a five-factor model structure aligning to the posited Stimulator, Spotter, Sculptor, Selector and Supporter dimensions*** is supported.

#### **4.3.5. Descriptive statistics**

Table 4.11 illustrates the descriptive statistics in relation to the variables of interest in the research – specifically concerning the mean and standard deviation values, as well as skewness figures as it is acknowledged that the constructs being measured would generally be viewed positively by participants, and this could result in negatively skewed data which may require the application of transformation techniques in order to provide more interpretable results in subsequent analyses. It can be seen that none of the skewness statistics are greater than 1, or less than -1; therefore the decision was made that the data were not sufficiently skewed to require any transformations to make them more normally distributed for analysis purposes. Table 4.12 outlines the descriptive statistics in relation to the demographic variables measured as part of the research.

*Table 4.11 – Descriptive statistics of independent and dependent variables*

	Mean	SD	Skewness Statistic
Creative Style (Time 1) (rated 1-6, N=3191)			
Stimulator	4.53	.83	-.45
Spotter	4.60	.69	-.72
Sculptor	4.48	.73	-.42
Selector	4.57	.72	-.41
Supporter	4.43	.81	-.50
Personality traits (Time 1) (rated 1-5, N=409)			
Openness to experience	4.04	.64	-.92
Conscientiousness	3.29	.90	-.14
Extraversion	2.79	.98	.26
Agreeableness	4.02	.66	-.75
Neuroticism	2.74	.90	.25
Creative/innovative Performance (Time 2) (rated 1-5, N=303)			
Task Presentation	3.91	.60	-.09
Idea Generation	3.52	.70	-.36
Idea Validation	3.76	.63	-.13
Outcome Assessment	3.85	.54	-.10

*Table 4.12 – Descriptive statistics of demographic variables*

	Mean	SD	Min	Max	Total
Age	35.47	10.61	19	70	
Sex					
Male					207 (51.0%)
Female					199 (49.0%)
Tenure in organisation	5.81	6.30	0	41	
Tenure in role	4.71	5.30	0	30	
Leadership responsibility					
Leader					192 (47.1%)
Non-leader					216 (52.9%)
Size of team managed	4.66	11.84	0	100	

#### **4.3.6. Demographic and control variables**

Table 4.13 illustrates the correlations between the research variables of interest, namely; creative styles (Stimulator, Spotter, Sculptor, Selector, Supporter all at time 1), personality traits (openness to experience, conscientiousness, extraversion, agreeableness, neuroticism all at time 1) and creative/innovative performance (task presentation, idea generation, idea validation, outcome assessment all at time 2) with demographic variables, namely; age, sex, tenure in organisation, tenure

in role, leadership responsibility and size of team responsible for. Coding for these variables can be found in section 4.2.3.

*Table 4.13 – Correlations between research variables of interest and demographic variables*

		Age	Sex (0 = female, 1 = male)	Org Tenure	Role Tenure	Leadership	Size of team
Creative style	Stimulator	.057	-.025	-.075	-.008	.072	.068
	Spotter	.134**	-.058	.054	.060	.204***	.079
	Sculptor	.080	-.017	.003	.015	.131**	.102*
	Selector	.077	-.069	.050	.032	.140**	.058
	Supporter	.097	-.084	.001	.004	.210***	.144**
Personality trait	Openness	.071	.011	-.056	.006	.110*	.095
	Conscientiousness	.170***	-.095	.220***	.115*	.238***	.134**
	Extraversion	.198***	-.043	-.003	.047	.150**	.082
	Agreeableness	.062	-.069	-.009	.064	-.005	.052
	Neuroticism	-.221***	-.176***	-.135**	-.131**	-.129**	-.050
Creat/Innov Perform.	Task Presentation	.033	-.009	.054	.056	.054	.027
	Idea Generation	.071	.023	.007	.020	.134*	.052
	Idea Validation	.015	-.058	.110	.046	.157*	.092
	Outcome Assessment	-.001	.042	.080	.007	.168**	.027

*N range=299-408; \* $p < .05$  \*\* $p < .01$  \*\*\* $p < .001$*

The correlations highlighted as significant indicate the following:

- When considering age in this participant sample it can be seen that the older an individual, the higher their preference for the Spotter creative style in general, the higher their levels of conscientiousness and extraversion, though lower on neuroticism.
- Males, in this sample, were seen to score lower on neuroticism.
- The longer somebody had been in the same role, or in the same organisation, correlated with higher levels of conscientiousness and lower levels of neuroticism.
- Being in a leadership position positively correlated with higher preferences for all creative styles except the Stimulator; higher levels of openness, conscientiousness and agreeableness; lower levels of neuroticism; and higher levels of creative/innovative performance at all stages of the creativity/innovation process except task presentation.
- Managing/leading larger teams positively correlated with higher levels of Sculptor and Supporter creative styles and the conscientiousness personality trait.

In further analyses presented, these factors will be considered as control variables when a significant correlation has been noted with the respective dependent variable.

#### 4.3.7. Correlations between creative style and personality

Table 4.14 illustrates all correlations between mean scores obtained on the five creative styles measured by the Creative ID tool (Stimulator, Spotter, Sculptor, Selector, Supporter) and the mean scores obtained on the five personality traits known as the ‘Big Five’ (Openness to Experience, Conscientiousness, Extraversion, Agreeableness and Neuroticism). The purpose of these analyses is to establish construct validity for the Creative ID measure of creative style – looking to demonstrate the relationships between creative styles and the personality traits that they should logically be aligned to. All correlations seen to be statistically significant are indicated, this level of significance is not unexpected due to the sample size (N = 409) therefore more specific attention will be paid to the effect sizes rather than p-values in isolation.

Table 4.14 – Correlations between creative styles and personality traits

	Openness	Conscientiousness	Extraversion	Agreeableness	Neuroticism
Stimulator	.710***	.133**	.259***	.176***	-.080
Spotter	.565***	.307***	.365***	.200***	-.172***
Sculptor	.552***	.238***	.329***	.226***	-.200***
Selector	.424***	.422***	.319***	.204***	-.249***
Supporter	.406***	.319***	.511***	.386***	-.291***

N=409; \* $p < .05$  \*\* $p < .01$  \*\*\* $p < .001$

In addressing the hypotheses relating to these relationships, it can be seen that:

***Hypothesis 2a – The Stimulator creative style positively correlates with openness to experience, to a greater extent than with other personality traits***

This hypothesis is supported as the correlation between the Stimulator creative style and openness being both significant and positive [ $r(409) = .710$ ,  $p < .001$ ], and a stronger relationship than with any other personality trait. A further analysis using Lee & Preacher’s (2013) software was used to determine whether the correlation between the Stimulator creative style and openness to experience ( $r = .710$ ) is significantly higher than the correlations between the Stimulator creative style and other personality traits (next highest being extraversion;  $r = .259$ ). This further supports the hypothesis as the difference between these correlations is significant [ $z(409) = 9.932$ ,  $p < .001$ ] indicating that the Stimulator creative style positively correlates with openness to experience to a greater extent than with other personality traits.

***Hypothesis 2b – The Spotter creative style positively correlates with openness to experience, to a greater extent than with other personality traits.***

This hypothesis is supported as the correlation between the Spotter creative style and openness being both significant and positive [ $r(409) = .565, p < .001$ ], and a stronger relationship than with any other personality trait. The difference between this correlation ( $r = .565$ ) and the next strongest (between Spotter and extraversion;  $r = .365$ ) is a statistically significant difference [ $z(409) = 4.080, p < .001$ ].

***Hypothesis 2c - The Sculptor creative style positively correlates with openness to experience, to a greater extent than with other personality traits.***

This hypothesis is supported as the correlation between the Sculptor creative style and openness being both significant and positive [ $r(409) = .552, p < .001$ ], and a stronger relationship than with any other personality trait. The difference between this correlation ( $r = .552$ ) and the next strongest (between Sculptor and extraversion;  $r = .329$ ) is a statistically significant difference [ $z(409) = 4.464, p < .001$ ].

***Hypothesis 2d – The Selector creative style positively correlates with conscientiousness, to a greater extent than with other personality traits.***

This hypothesis is partially supported as the correlation between the Selector creative style and conscientiousness was found to be significant and positive [ $r(409) = .422, p < .001$ ]; however, the Selector creative style was found to have a stronger relationship with openness to experience [ $r(409) = .424, p < .001$ ].

***Hypothesis 2e – The Supporter creative style positively correlates with agreeableness, to a greater extent than with other personality traits.***

This hypothesis is partially supported as the correlation between the Supporter creative style and agreeableness was found to be significant and positive [ $r(409) = .386, p < .001$ ]; however, the Supporter creative style was found to have a stronger relationship with both extraversion [ $r(409) = .511, p < .001$ ] and openness to experience [ $r(409) = .406, p < .001$ ].

In summary, when considering the convergent validity of the Creative ID tool – whereby creative styles as measured by the tool are seen to ‘converge’ (i.e. align with) expected personality traits – the hypotheses outlined above indicate that generally, there is support provided for the tool measuring creative styles as they are expected to be measured. Furthermore, divergent validity can be considered in looking into which creative styles should not have such strong relationships with certain personality traits – when considering the construct correlations from this approach, this lends further support to the Creative ID as a tool which measures creative styles as they are defined. Neuroticism is defined as “...perceived as being anxious, generally apprehensive, and prone to worry. She often feels frustrated, irritable, and angry at others...” (Costa and McCrae, 1992), this description of a personality

trait has no obvious overlap with any of the creative styles, and in fact could logically have a negative relationship with creative styles which prefer to be decisive (Selector,  $r = -.249$ ) and work with others as well as encourage them (Supporter,  $r = -.291$ ). All of the creative styles measured were seen to have either no significant correlation, or a significant negative correlation with neuroticism, with the Selector and Supporter styles having the strongest negative relationships. Overall, these interpretations could be considered to provide some support for the construct validity of the Creative ID tool whereby it has been seen to measure styles that both align with other established traits as expected (convergent validity) but are also to some distanced from established traits as expected as well (divergent validity).

#### 4.3.8. Correlations between creative style and creative/innovative performance

Table 4.15 illustrates all correlations between the mean scores obtained on the five creative styles measured by the Creative ID tool (Stimulator, Spotter, Sculptor, Selector, Supporter) and mean scores obtained on the four measures of creative/innovative performance as measured on a self-report subjective basis (Task Presentation, Idea Generation, Idea Implementation and Outcome Assessment). The purpose of these analyses is to establish criterion validity for the Creative ID measure of creative style – looking to demonstrate that creative style is related to, and can predict, outcome measures such as creative/innovative performance. The correlations stated refer to the measures of creative style taken at time 1, with measure of creative/innovative performance taken at time 2 (six months later). As previous outlined (in section 4.2.1) this decision to measure creative style at time 1 and creative/innovative performance at time 2 has been made in a conscious attempt to both minimise common method variance, as well as provide greater insight into whether there is a potentially predictive relationship rather than simply a correlation relationship at a snapshot in time.

*Table 4.15 – Correlations between creative styles and creative/innovative performance*

	TaskPres (T2)	IdeaGen (T2)	IdeaVal (T2)	OutAssess (T2)
Stimulator (T1)	.431***	.551***	.294***	.249***
Spotter (T1)	.387***	.548***	.328***	.318***
Sculptor (T1)	.443***	.511***	.363***	.328***
Selector (T1)	.361***	.373***	.363***	.420***
Supporter (T1)	.399***	.387***	.361***	.300***

$N=303$ ; \*\*\* $p<.001$

Considering the creativity and innovation process as a linear sequential process (as outlined in Amabile & Pratt, 2016), task presentation and idea generation could be considered as being 'earlier' in the process, with idea validation and outcome assessment as the 'later' stages. Bearing this in mind we can see that the Stimulator, Spotter and Sculptor creative styles are more strongly correlated with performance at the earlier stages of the creativity and innovation process (Task Presentation and Idea Generation) implying that they are more closely aligned to what would traditionally be termed 'creativity'; whilst the Selector creative style (with Outcome Assessment) has the stronger correlation with the performance measure at the end of the creativity and innovation process, implying that this is more closely aligned to the activities which would traditionally be termed innovation. In determining whether these differences in correlation coefficients are meaningful we can see that in relation to the Stimulator creative style, the difference between task presentation ( $r = .431$ ) at the start of the creativity/innovation process and idea validation ( $r = .294$ ) toward the end of the process are significantly different [ $z(303) = 2.544, p = .011$ ] using Lee & Preacher's (2013) calculation software.

In terms of the Spotter creative style and assessing the smallest 'gap' between the earlier stages and latter stages, the difference between the correlations task presentation ( $r = .387$ ) and idea validation ( $r = .328$ ) is not significantly different [ $z(303) = 1.088, p = .277$ ]. Finally, in assessing these differences in relation to the Sculptor creative style, the difference between task presentation ( $r = .443$ ) and idea validation ( $r = .363$ ) is also not significantly different [ $z(303) = 1.517, p = .129$ ]. When looking at the Selector creative style, this is most strongly correlated with outcome assessment at the end of the creativity/innovation process ( $r = .420$ ) yet this is not significantly different to correlations with performance at other stages of the creative/innovative process. In summary, these results imply that in terms of statistical significance, the Stimulator creative style is the one that has the clearest alignment with one part of the creative/innovative process, with a significantly stronger correlation for the start of the creative process involving task presentation and idea generation.

It is interesting to note that both the Spotter and Supporter creative styles are never found to be the most highly correlated creative style with any of the performance measures. Regarding the Spotter creative style, this may be explained as with the Spotter this was expected with a hypothesis stating that it would be most closely related to preparation, though unfortunately the measure of preparation performance was not found to meet statistical requirements and was therefore omitted from the research, leaving this hypothesis untested. In addition to the hypothesised outcomes, this observation regarding the Supporter creative style makes logical and theoretical sense as it is the only creative style which is not strictly concerned with individual performance, and is therefore expected to be a

'secondary' style behind others when considering individual performance as it is more focused on enabling the performance of others. This of course inevitably leads to comparisons between the Supporter creative style and leadership – an issue that will be discussed in greater detail and more fully addressed in Study 2 (chapter 5). All of this adds weight to the argument that historically, creative style has been defined in a much too narrow way, and that broadening the definition and measurement can contribute meaningful insight to both the theory of creativity, and relationships between creative style and creative/innovative performance.

#### **4.3.9. Regressions**

Preliminary analyses were conducted to determine whether demographic variables (sex, age, time in organisation, time in role, leadership responsibility and number of people managed) had a correlation relationship with any of the dependent variables of interest (task presentation, idea generation, idea validation and outcome assessment) and should therefore be considered in the regression models (as detailed in section 4.3.5). Based on this analysis, only leadership responsibility was controlled for in the regression analyses. In Model 1 of each analysis the predictor variable added to the model was leadership responsibility, this was to ensure that any variance in the dependent variable which could be attributed to demographic variable was accounted for. In Model 2 of each analysis the predictor variables added to the model were personality traits (openness to experience, conscientiousness, extraversion, agreeableness and neuroticism) to determine how much variance in creative/innovative performance these accounted for, beyond that already accounted for by demographic variables. Finally, in Model 3 of each analysis the predictor variables added to the model were creative styles (Stimulator, Spotter, Sculptor, Selector and Supporter), the main variables of interest, to determine how much variance can be accounted for beyond that already accounted for in Models 1 and 2 – therefore providing a more accurate interpretation of the relationship between creative styles and creative/innovative performance after controlling for the variance accounted for by other variables. In addition to the regression output, each table includes an  $R^2$  and  $R^2$  change value to demonstrate the variance explained by each model, the associated change between models, and whether each model (and change) is deemed statistically significant. All regression coefficients (B) are unstandardised.



Table 4.16 – Regression: Leadership responsibility, personality traits and creative styles (all measured at Time 1) predicting Task Presentation at time 2

	Model 1		Model 2		Model 3	
	B	SE	B	SE	B	SE
Leadership Responsibility	.061	.070	.033	.067	-.057	.064
Openness			.302***	.061	-.037	.079
Conscientiousness			.199**	.060	.166**	.059
Extraversion			-.033	.049	-.113*	.049
Agreeableness			.128*	.052	.031	.058
Neuroticism			.008	.048	-.015	.045
Stimulator					.191***	.056
Spotter					-.022	.064
Sculptor					.123	.064
Selector					.031	.071
Supporter					.134**	.050
	F(1,297) = .764		F(6,292) = 9.513***		F(11,287) = 10.990***	
	R <sup>2</sup> = .003		R <sup>2</sup> = .164		R <sup>2</sup> = .296	
Model Change			F(5,292) = 11.236***		F(5,287) = 10.839***	
			$\Delta R^2$ = .161		$\Delta R^2$ = .133	

N=303; \*p<.05 \*\*p<.01 \*\*\*p<.001

Table 4.17 – Regression: Leadership responsibility, personality traits and creative styles (all measured at Time 1) predicting Idea Generation at time 2

	Model 1		Model 2		Model 3	
	B	SE	B	SE	B	SE
Leadership Responsibility	.253**	.080	.225**	.072	.128	.068
Openness			.561***	.066	.142	.084
Conscientiousness			.096	.065	.067	.063
Extraversion			.002	.053	-.049	.052
Agreeableness			.034	.065	.008	.062
Neuroticism			-.039	.052	-.075	.048
Stimulator					.198**	.060
Spotter					.219**	.069
Sculptor					.127	.068
Selector					-.071	.076
Supporter					-.024	.053
	F(1,297) = 9.973**		F(6,292) = 19.336***		F(11,287) = 17.670***	
	R <sup>2</sup> = .032		R <sup>2</sup> = .284		R <sup>2</sup> = .404	
Model Change			F(5,292) = 20.552***		F(5,287) = 11.500***	
			$\Delta R^2$ = .252		$\Delta R^2$ = .119	

N=303; \*p<.05 \*\*p<.01 \*\*\*p<.001

Table 4.18 - Regression: Leadership responsibility, personality traits and creative styles (all measured at Time 1) predicting Idea Validation at time 2

	Model 1		Model 2		Model 3	
	B	SE	B	SE	B	SE
Leadership Responsibility	.224**	.072	.192**	.070	.121	.069
Openness			.190**	.064	-.027	.086
Conscientiousness			.291***	.064	.226***	.064
Extraversion			.022	.052	-.058	.054
Agreeableness			.059	.064	.014	.063
Neuroticism			.124*	.051	.115*	.049
Stimulator					.083	.061
Spotter					-.064	.070
Sculptor					.091	.070
Selector					.153*	.077
Supporter					.140*	.054
	F(1,297) = 9.594**		F(6,292) = 8.773***		F(11,287) = 8.289***	
	R <sup>2</sup> = .031		R <sup>2</sup> = .153		R <sup>2</sup> = .241	
Model Change			F(5,292) = 8.371***		F(5,287) = 6.683***	
			$\Delta R^2 = .121$		$\Delta R^2 = .088$	

N=303; \*p<.05 \*\*p<.01 \*\*\*p<.001

Table 4.19 – Regression: Leadership responsibility, personality traits and creative styles (all measured at Time 1) predicting Outcome Assessment at time 2

	Model 1		Model 2		Model 3	
	B	SE	B	SE	B	SE
Leadership Responsibility	.186**	.062	.139*	.059	.094	.059
Openness			.143**	.054	-.021	.073
Conscientiousness			.307***	.053	.240***	.054
Extraversion			-.010	.044	-.054	.045
Agreeableness			.031	.054	.020	.054
Neuroticism			.046	.043	.042	.042
Stimulator					.059	.051
Spotter					-.017	.059
Sculptor					.042	.059
Selector					.195**	.065
Supporter					.035	.046
	F(1,297) = 9.116**		F(6,292) = 10.740***		F(11,287) = 8.768***	
	R <sup>2</sup> = .030		R <sup>2</sup> = .181		R <sup>2</sup> = .252	
Model Change			F(5,292) = 10.765***		F(5,287) = 5.426***	
			$\Delta R^2 = .151$		$\Delta R^2 = .071$	

N=303; \*p<.05 \*\*p<.01 \*\*\*p<.001

In summary, *Tables 4.16-4.19* show that when looking at Step 1 of each model, leadership responsibility is a significant predictor of idea generation, idea validation and outcome assessment performance whereby being a leader predicts a higher level of performance, though this was not a significant predictor of task presentation performance.

When looking at Step 2, where personality traits are added to leadership responsibility as predictor variables, we see openness to experience was found to be a significant positive predictor of all performance measures; conscientiousness was a significant positive predictor of task presentation, idea validation and outcome assessment; agreeableness was found to be a significant positive predictor of task presentation; and neuroticism was found to be a significant positive predictor of idea validation. Each of these results indicates that a higher score in the personality trait stated results in a higher performance score on the performance measures stated. Overall, these models are all considered to account for a significant amount of variance in the dependent variable (between 15.3% and 28.4%), as well as showing a significant increase from the previous model (between 12.1% and 25.2%).

When looking at Step 3, where creative styles are added to the model as predictors, all models show a significant amount of additional variance in creative/innovative performance is seen to be accounted for by creative styles, beyond that accounted for by demographic variables and personality traits (between 7.1% and 13.3% added). We see that Stimulator emerges as a significant positive predictor of task presentation and idea generation; Spotter also as a significant positive predictor of idea generation; Selector as a significant positive predictor of idea validation and outcome assessment; and Supporter as a significant positive predictor of task presentation and idea validation. Sculptor creative style was not found to be a significant predictor of any performance measure after controlling for leadership responsibility and personality. Overall, it is worth noting that as personality traits and creative styles are added to each model, the regression coefficient of leadership responsibility is reduced which would suggest that some of the variance in leadership and performance can be accounted for by personality and creative styles.

When relating these findings to the research hypotheses:

***Hypothesis 2f – The Stimulator creative style is positively related to perceived levels of performance at the idea generation stage; it will show a stronger relationship with idea generation performance than other creative styles.***

This hypothesis is partially supported. The Stimulator creative style was found to be a significant positive predictor of idea generation performance [ $B = .198$ ,  $t(3.323)$ ,  $p = .001$ ] as well as being positively correlated [ $r(303) = .551$ ,  $p < .001$ ]. However, this was not found to be the creative style with the strongest predictive relationship with the Spotter creative style also positively predicting idea generation performance [ $B = .219$ ,  $t(3.191)$ ,  $p = .002$ ].

***Hypothesis 2g – The Spotter creative style is positively related to perceived levels of performance at the preparation stage; it will show a stronger relationship with preparation performance than other creative styles.***

This hypothesis could not be tested as the measure of preparation performance did not meet acceptable levels of reliability for inclusion in the research.

***Hypothesis 2h – The Selector creative style is positively related to perceived levels of performance at the task presentation stage; it will show a stronger relationship with task presentation performance than other creative styles.***

This hypothesis was not supported. The Selector creative style and task presentation performance were found to be positively correlated,  $r(303) = .361$ ,  $p < .001$ . However, this was not the creative style with the strongest correlation relationship with task presentation performance [Stimulator  $r = .431$ ; Spotter  $r = .387$ ; Supporter  $r = .399$ ; all  $p < .001$ ], in fact only the Sculptor creative style had a weaker correlation [ $r = .310$ ]. More importantly, the Selector creative style was not found to be a significant predictor of task presentation performance in the regression analysis.

***Hypothesis 2i – The Selector creative style is positively related to perceived levels of performance at the idea validation stage; it will show a stronger relationship with idea validation performance than other creative styles.***

This hypothesis was partially supported. The Selector creative style was found to be a significant positive predictor of idea validation performance [ $B = .153$ ,  $t(1.974)$   $p = .049$ ], though the results are not as statistically significant as that of the Supporter creative style [ $B = .140$ ,  $t(2.595)$   $p = .010$ ] so it cannot be said that this style has a stronger relationship with idea validation performance than other creative styles. The Selector creative style and idea validation performance were found to be positively correlated,  $r(303) = .363$ ,  $p < .001$ .

***Hypothesis 2j – The Selector creative style is positively related to perceived levels of performance at the outcome assessment stage; it will show a stronger relationship with outcome assessment performance than other creative styles.***

This hypothesis was supported. The Selector creative style and outcome assessment performance were found to be significantly positively correlated [ $r(303) = .420$ ,  $p < .001$ ]; the Selector creative style

was also found to be a significant positive predictor of outcome assessment performance [ $B = .195$ ,  $t(1.985) p = .003$ ] – the only creative style to be a significant predictor of this measure of performance.

Overall, when looking at the  $R^2$  values, the third step of each model (the stage at which creative styles are added) are all considered to account for a significant amount of variance on the dependent variable, with a significant increase from the previous model (between 7.1% and 13.3% of explained variance added). Additionally, specific creative styles are noted as predictors of specific performance measures discussed above, this all implies that there is support for Hypothesis 3:

***Hypothesis 3 - Creative style(s) accounts for a significant amount of additional variance in creative/innovative performance beyond that explained by personality traits alone.***

Additionally, Table 4.20 shows a series of regression analyses conducted to determine how much of the variance in an individual's creative style (as measured by the Creative ID) could be attributed to personality traits. Referring back to the findings of von Wittich and Antonakis (2011) which found that 67% of the variance in responses on the KAI could be accounted for by personality measures alone, resulting in a query relating to what extent it can measure anything meaningful beyond the personality measure. Although each regression model was statistically significant at the  $p < .001$  level, with specific personality traits identified as predictors of creative style, these results show that across the five creative styles (Stimulator, Spotter, Sculptor, Selector, Supporter), the variance explained by personality traits ranges from 31.8% (Selector) to 42.8% (Stimulator) – implying that creative style(s) as measured by the Creative ID tool are aligned to the Big Five personality measure to a lesser extent than that observed by von Wittich and Antonakis in relation to the KAI.

*Table 4.20 – Regression: Personality traits (at Time 1) predicting Creative Styles at time 2*

	Stimulator		Spotter		Sculptor		Selector		Supporter	
	B	SE	B	SE	B	SE	B	SE	B	SE
Openness	.885***	.067	.600***	.069	.610***	.071	.347***	.059	.369***	.083
Conscientiousness	-.035	.065	.206**	.068	.162*	.069	.370***	.058	.160*	.081
Extraversion	.073	.054	.157**	.056	.185**	.057	.065	.048	.431***	.067
Agreeableness	.007	.066	.027	.068	.042	.070	-.030	.058	.212**	.082
Neuroticism	-.039	.053	-.043	.054	.012	.056	-.065	.047	.025	.065
	F(5,296) = 44.220***		F(5,296) = 32.046***		F(5,296) = 29.359***		F(5,296) = 27.548***		(5,296) = 29.282***	
	$R^2 = .428$		$R^2 = .351$		$R^2 = .332$		$R^2 = .318$		$R^2 = .331$	

N=302; \* $p < .05$  \*\* $p < .01$  \*\*\* $p < .001$

#### 4.4. Results: Research Question 2

***Research Question 2: Is an individual's creative style more state-like or more trait-like in its changeability over time and which factors contribute to observed changes?***

Paired-samples t-tests and regression analyses were used to explore the change in creative styles over time, and to explore which experiences work-life events had an impact (if at all) on any observed changes over time (Hypotheses 4a-4h).

##### 4.4.1. Paired sample t-tests and regression analyses

To investigate a change in creative style preferences over time, the data from Time 1 and Time 2 (6 months later) were utilised. Mean scores of each creative style preference were created, with the statistical strategy being to:

- Firstly, assess whether there were significant changes in creative style preference over time for the entire population;
- Secondly, assess whether there were significant changes in creative style preference over time when taking into account the experience of work-life events;
- Finally, to assess the extent to which variance in creative style preferences can be explained by the experience of work-life events, whilst taking into account previous creative style preferences and demographic variables.

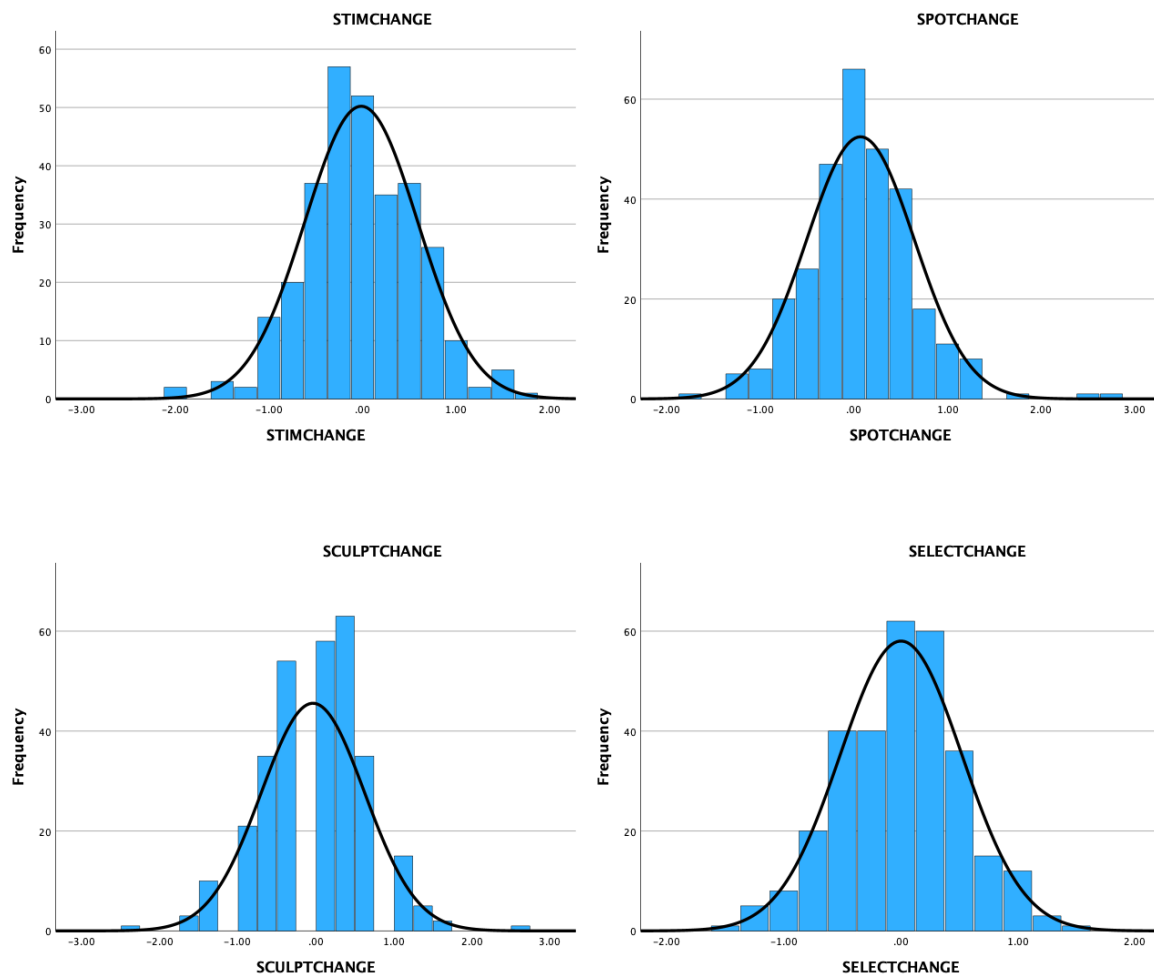
A paired samples t-test determined that Spotter mean score at time 1 ( $M = 4.23$ ,  $SD = 0.82$ ) and mean score at time 2 (6 months later;  $M = 4.30$ ,  $SD = 0.78$ ) differed significantly across the two time points ( $t(302) = 2.119$ ,  $p = .035$ ) for the population as a whole. This indicates a statistically significant increase in the mean creative style preference score over time. However, paired sample t-tests of the other creative styles (Stimulator, Sculptor, Selector and Supporter) determined that the mean scores between time 1 and time 2 did not differ significantly for the population as a whole in relation to those styles (Table 4.20). When exploring a change of creative style over time (by subtracting time 2 mean from time 1 mean) it can be seen that although each creative style *can* change, both positively and negatively over time, the majority of the participants experienced little change in their creative style preferences (see 4.20 for means and standard deviations) with change values largely following a normal distribution (Figure 4.2).

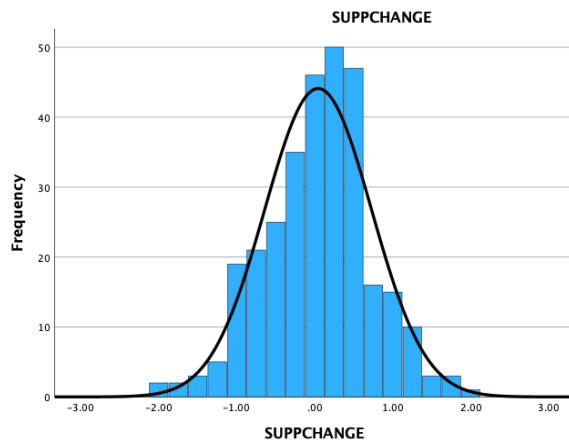
Table 4.21 – Descriptive statistics of creative style preference scores for the entire participant population at time 1, time 2, and change between timepoints

	Time 1		Time 2		Change over time (T2 – T1)			
	Mean	SD	Mean	SD	Mean	SD	Max neg. change	Max pos. change
Stimulator	4.51	.87	4.50	.81	-.01	.60	-2.00	1.75
Spotter	4.23	.82	4.30	.78	.07	.58	-1.75	2.75
Sculptor	4.44	.78	4.40	.79	-.04	.66	-2.33	2.67
Selector	4.65	.66	4.65	.65	.00	.52	-1.50	1.50
Supporter	4.11	.91	4.15	.92	.04	.69	-2.00	2.00

N=303

Figure 4.2 – Distributions of change in creative style over time (Time 2 – Time 1)





However, when comparing the two groups of those who experienced each work-life experience against those who did not, a more interesting story emerges. Tables 4.12-4.26 outline the means, standard deviations and changes over time for participants who experienced each work-life experience – paired samples t-tests comparing the time 1 and time 2 mean scores for these populations highlighted two statistically significant differences. The first being a significant increase in the Supporter creative style preference for those participants promoted to a leadership position within the previous six months [ $t(83) = 2.297, p = .024$ ]; the second being a significant increase in the Spotter creative style for those participants who experienced a period of three or more months of unemployment in the previous six months [ $t(35) = 2.242, p = .031$ ]. These analyses were also run in relation to participants who had not experienced each of the work-life events for comparison, as stated beneath each table below, each of these analyses was seen to be statistically non-significant, except for the Spotter creative style for participants who had not experienced redundancy which showed a significant increase. Given that the participant sample who had not experienced redundancy represents 95.7% of the total population, it is no surprise that this finding replicates that of the entire population sample detailed previously.

*Table 4.22 – Descriptive statistics of experienced work-life events*

	Experienced	Not Experienced
New educational course	175 (58.3%)	125 (41.7%)
Creativity training	73 (24.3%)	227 (75.7%)
Promoted to leadership	84 (28.0%)	216 (72.0%)
Redundancy	13 (4.3%)	287 (95.7%)
Unemployment	36 (12.0%)	264 (88.0%)

N = 303



Table 4.23 – Descriptive statistics of creative style preference scores time 1, time 2, and change between timepoints in relation to experiencing a new educational course

	Time 1		Time 2		Change over time (T2 – T1)		
	Mean	SD	Mean	SD	Mean	SD	Sig
Stimulator	4.52	.89	4.52	.84	.00	.61	-
Spotter	4.22	.88	4.28	.86	.05	.61	-
Sculptor	4.48	.83	4.42	.87	-.06	.69	-
Selector	4.64	.68	4.66	.70	.01	.54	-
Supporter	4.13	.93	4.19	.95	.06	.67	-

N=175; Sig = significance of paired-samples t-test between T1 and T2 mean scores;

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

Note: all paired-samples t-test between T1 and T2 mean scores of participants who **did not** experience new educational course were non-significant

Table 4.24 – Descriptive statistics of creative style preference scores time 1, time 2, and change between timepoints in relation to experiencing creativity training

	Time 1		Time 2		Change over time (T2 – T1)		
	Mean	SD	Mean	SD	Mean	SD	Sig
Stimulator	4.79	.77	4.71	.78	-.08	.60	-
Spotter	4.48	.74	4.56	.71	.08	.62	-
Sculptor	4.70	.80	4.67	.72	-.03	.64	-
Selector	4.85	.61	4.77	.69	-.07	.54	-
Supporter	4.52	.76	4.54	.76	.02	.66	-

N=73; Sig = significance of paired-samples t-test between T1 and T2 mean scores;

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

Note: all paired-samples t-test between T1 and T2 mean scores of participants who **did not** experience creativity training were non-significant

Table 4.25 – Descriptive statistics of creative style preference scores time 1, time 2, and change between timepoints in relation to experiencing promotion to a leadership position

	Time 1		Time 2		Change over time (T2 – T1)		
	Mean	SD	Mean	SD	Mean	SD	Sig
Stimulator	4.64	.83	4.71	.69	.07	.55	-
Spotter	4.44	.76	4.56	.69	.12	.58	-
Sculptor	4.64	.78	4.69	.70	.05	.67	-
Selector	4.76	.70	4.87	.68	.11	.51	-
Supporter	4.43	.79	4.57	.68	.15	.59	*

N=84; Sig = significance of paired-samples t-test between T1 and T2 mean scores;

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

Note: all paired-samples t-test between T1 and T2 mean scores of participants who **did not** experience promotion to a leadership position were non-significant

*Table 4.26 – Descriptive statistics of creative style preference scores time 1, time 2, and change between timepoints in relation to experiencing redundancy*

	Time 1		Time 2		Change over time (T2 – T1)		
	Mean	SD	Mean	SD	Mean	SD	Sig
Stimulator	4.92	.70	4.79	.82	-.13	.51	-
Spotter	4.54	.58	4.48	.67	-.06	.46	-
Sculptor	4.62	.72	4.62	.62	.00	.56	-
Selector	4.77	.67	4.56	.61	-.21	.43	-
Supporter	4.65	.81	4.52	.54	-.13	.65	-

*N=13; Sig = significance of paired-samples t-test between T1 and T2 mean scores;*

*\*p<.05; \*\*p<.01; \*\*\*p<.001*

*Note: all paired-samples t-test between T1 and T2 mean scores of participants who **did not** experience redundancy were non-significant, except for Spotter creative style (p = .04)*

*Table 4.27 – Descriptive statistics of creative style preference scores time 1, time 2, and change between timepoints in relation to experiencing a period of unemployment*

	Time 1		Time 2		Change over time (T2 – T1)		
	Mean	SD	Mean	SD	Mean	SD	Sig
Stimulator	4.63	.92	4.54	.97	-.09	.70	-
Spotter	4.05	.93	4.21	.96	.16	.43	*
Sculptor	4.31	.79	4.32	.85	.02	.64	-
Selector	4.49	.61	4.60	.67	.11	.54	-
Supporter	4.04	1.04	4.03	1.18	-.01	.76	-

*N=36; Sig = significance of paired-samples t-test between T1 and T2 mean scores;*

*\*p<.05; \*\*p<.01; \*\*\*p<.001*

*Note: all paired-samples t-test between T1 and T2 mean scores of participants who **did not** experience unemployment were non-significant*

Next, regression analyses were conducted to explore the proportion of variance in creative style at time 2 accounted for by the experience of work-life events; whilst controlling for individual creative style preference at time 1 and demographic factors. For completeness, this was done for all five creative styles. Firstly, as the focus of this research is the change in an individual's creative style over time creative style at time 1 was controlled for in the first step of the regression model, ensuring that it is the change in creative style over time that was predicted rather than simply the level of creative style; next, demographic factors included for control purposes (age and organisational tenure were the only factors with significant correlations with creative styles) to see if they contribute additional variance; finally, the work life events were added to the model to determine if they were significant predictors of a change in creative style after controlling for previous creative style and demographic factors.

*Table 4.28 – Regression: Stimulator creative style preference at Time 1, demographic variables, and experience of work life events predicting Stimulator creative style preference at time 2*

	Model 1		Model 2		Model 3	
	B	SE	B	SE	B	SE
Stimulator Time 1	690***	.036	.675***	.037	.671***	.037
Age			.007	.004	.008*	.004
Leadership Responsibility			.021	.064	-.075	.073
Size of team responsible for			.001	.001	.001	.001
New educational course					.059	.067
Creativity training					.012	.076
Promoted to leadership					.213**	.080
Redundancy					-.012	.159
Unemployment					-.069	.100
	F(1,297) = 376.271***		F(5,293) = 76.165***		F(10,288) = 11.271***	
	R <sup>2</sup> = .559		R <sup>2</sup> = .565		R <sup>2</sup> = .578	
Model Change			F(4,293) = 1.061		F(5,288) = 1.733	
			$\Delta R^2 = .006$		$\Delta R^2 = .013$	

N=299; \*p<.05 \*\*p<.01 \*\*\*p<.001

*Table 4.29 – Regression: Spotter creative style preference at Time 1, demographic variables, and experience of work life events predicting Spotter creative style preference at time 2*

	Model 1		Model 2		Model 3	
	B	SE	B	SE	B	SE
Spotter Time 1	.709***	.037	.692***	.038	.678***	.039
Age			.006	.003	.007*	.003
Leadership Responsibility			.039	.063	-.048	.071
Size of team responsible for			.000	.001	.000	.001
New educational course					-.031	.065
Creativity training					.128	.074
Promoted to leadership					.194*	.078
Redundancy					-.118	.154
Unemployment					.053	.098
	F(1,297) = 372.592***		F(5,293) = 75.947***		F(10,288) = 39.714***	
	R <sup>2</sup> = .556		R <sup>2</sup> = .564		R <sup>2</sup> = .580	
Model Change			F(4,293) = 1.348		F(5,288) = 2.081	
			$\Delta R^2 = .008$		$\Delta R^2 = .015$	

N=299; \*p<.05 \*\*p<.01 \*\*\*p<.001

*Table 4.30 – Regression: Sculptor creative style preference at Time 1, demographic variables, and experience of work life events predicting Sculptor creative style preference at time 2*

	Model 1		Model 2		Model 3	
	B	SE	B	SE	B	SE
Sculptor Time 1	.659***	.045	.642***	.045	.619***	.046
Age			.006	.004	.006	.004
Leadership Responsibility			.148*	.071	.063	.081
Size of team responsible for			.000	.001	.000	.001
New educational course					-.005	.074
Creativity training					.138	.085
Promoted to leadership					.188*	.090
Redundancy					.042	.176
Unemployment					.003	.112
	F(1,297) = 219.184***		F(5,293) = 46.332***		F(10,288) = 24.205***	
	R <sup>2</sup> = .425		R <sup>2</sup> = .442		R <sup>2</sup> = .457	
Model Change			F(4,293) = 2.219		F(5,288) = 1.602	
			$\Delta R^2$ = .017		$\Delta R^2$ = .015	

N=299; \*p<.05 \*\*p<.01 \*\*\*p<.001

*Table 4.31 – Regression: Selector creative style preference at Time 1, demographic variables, and experience of work life events predicting Selector creative style preference at time 2*

	Model 1		Model 2		Model 3	
	B	SE	B	SE	B	SE
Selector Time 1	.682***	.042	.660***	.042	.665***	.043
Age			.005	.003	.006	.003
Leadership Responsibility			.116*	.057	.036	.064
Size of team responsible for			.000	.001	.000	.001
New educational course					.048	.059
Creativity training					-.021	.067
Promoted to leadership					.181**	.070
Redundancy					-.227	.139
Unemployment					.111	.088
	F(1,297) = 264.461***		F(5,293) = 55.818***		F(10,288) = 29.738***	
	R <sup>2</sup> = .471		R <sup>2</sup> = .488		R <sup>2</sup> = .508	
Model Change			F(4,293) = 2.405*		F(5,288) = 2.362*	
			$\Delta R^2$ = .017		$\Delta R^2$ = .020	

N=299; \*p<.05 \*\*p<.01 \*\*\*p<.001

Table 4.32 – Regression: Supporter creative style preference at Time 1, demographic variables, and experience of work life events predicting Supporter creative style preference at time 2

	Model 1		Model 2		Model 3	
	B	SE	B	SE	B	SE
Supporter Time 1	.728***	.041	.695***	.041	.668***	.043
Age	.		.006	.004	.007	.004
Leadership Responsibility			.232**	.076	.141	.086
Size of team responsible for			.000	.001	.000	.001
New educational course					.077	.078
Creativity training					.110	.091
Promoted to leadership					.208*	.095
Redundancy					-.025	.187
Unemployment					-.074	.118
	F(1,297) = 319.064***		F(5,293) = 69.795***		F(10,288) = 36.172***	
	R <sup>2</sup> = .518		R <sup>2</sup> = .544		R <sup>2</sup> = .557	
Model Change			F(4,293) = 4.123**		F(5,288) = 1.707	
			$\Delta R^2 = .026$		$\Delta R^2 = .013$	

N=299; \*p<.05 \*\*p<.01 \*\*\*p<.001

In summary, Tables 4.27-4.31 indicate that after controlling for previous creative style and demographic factors, being promoted to a leadership position in the preceding six months is a significant predictor of change in an individual's creative style preference. This is the case for all of the five creative styles whereby promotion to a leadership position relates to an increase in each of the creative styles (all significant at the p<.05 level). This further highlights the importance of leadership in the study of creative style, which is explored in greater detail in Study 2.

In terms of addressing the final hypotheses of Study 1, the majority of these hypotheses (specifically 4a-4g) were not supported.

**Hypothesis 4a – There will be a significant decrease in Stimulator creative style following experience of negative work-life event(s) in the preceding six months.**

**Hypothesis 4b – There will be a significant decrease in Spotter creative style following experience of negative work-life event(s) in the preceding six months.**

**Hypothesis 4c - There will be a significant decrease in Sculptor creative style following experience of negative work-life event(s) in the preceding six months.**

**Hypothesis 4d - There will be a significant decrease in Selector creative style following experience of negative work-life event(s) in the preceding six months.**

***Hypothesis 4e - There will be a significant decrease in Supporter creative style following experience of negative work-life event(s) in the preceding six months.***

***Hypothesis 4f - There will be a significant increase in Stimulator creative style following experience of creativity training in the preceding six months.***

***Hypothesis 4g - There will be a significant increase in Selector creative style following experience of starting an educational course in the preceding six months.***

It was expected, based on the literature, that the experience of negative work-life events would relate to a decrease in creative styles – these relationships were not found in the data. Further research would be required to better understand this, however, it could be assumed that either; the negative work-life events which have been seen in previous research to relate to a decrease in certain personality traits, do not have the same relationship with creative styles as this is a much more precise construct in terms of its scope – regarding the working preferences of an individual in the pursuit of creativity, compared to the very broad scope of personality traits which permeate every element of an individual's life. Alternatively, it should be considered (as detailed in the respective discussion in section 4.5.3) whether the constraints of the current research in terms of the six month timescale is a limiting factor in that (compared to the research on personality traits which is usually studied across at least 3 years) there may not have been sufficient time to detect a significant change in creative style.

Additionally, it was expected that there would be an increase in the Stimulator creative style over time for those who experienced creativity training – this prediction was made due to the general focus of creativity training being on the development and generation of new ideas, which (following such training) would lead to the expectation or need to demonstrate that these skills had been acquired, therefore increasing the individual's Stimulator creative style which primarily focuses on idea generation. However, this lack of a relationship could be explained by the lack of precision in measurement of the creative training work-life event – it was not specified exactly which types of training should be considered as 'creativity training', and additionally, there was no indication of whether the training experienced was useful, valuable or of a high quality. Each of these elements could have an impact on the skill acquisition, the subsequent need/requirement/expectation to demonstrate such behaviours, and the related creative style. A further expectation was that an increase in the Selector creative style would follow the experience of starting an educational course, again this relationship was not observed, though as explained above regarding the creativity training, more detail around the educational course may have been beneficial in determining if the work-life

events experienced were structured and demanding enough in their nature to require such a change in creative style.

Finally, support was found for Hypothesis 4h, stated below.

***Hypothesis 4h - There will be a significant increase in Supporter creative style following experience of being promoted to a leadership position in the preceding six months.***

This implied that, in line with expectations, when an individual is promoted to a leadership position they are required to directly consider the performance of others, and therefore an increase in the Supporter creative style reflects this increase in ‘other-focus’ when it comes to the pursuit of creativity. This relationship was noted both in the comparison of means between Time 1 and Time 2 of those individuals who had been promoted to a leadership position; and also in the regression analysis which demonstrated that being promoted to a leadership position was able to positively and significantly explain change in the Supporter creative style level at Time 2, after controlling for Supporter creative style level at Time 1, demographic variables, and other work-life experiences (both positive and negative).

*Table 4.33 – Summary of Hypotheses and results*

Research Question	Hypothesis	Outcome
1 - How robust is the Creative ID measure of creative style, and to what extent can creative style explain variance in creative/innovative performance beyond that which can be accounted for by personality traits alone?	<b>1 - The Creative ID measure of creative style fits a five-factor model structure aligning to the posited Stimulator, Spotter, Sculptor, Selector and Supporter dimensions.</b>	<b>Supported</b>
	<b>2a – The Stimulator creative style positively correlates with openness to experience, to a greater extent than with other personality traits.</b>	<b>Supported</b>
	<b>2b – The Spotter creative style positively correlates with openness to experience, to a greater extent than with other personality traits.</b>	<b>Supported</b>
	<b>2c – The Sculptor creative style positively correlates with openness to experience, to a greater extent than with other personality traits.</b>	<b>Supported</b>
	2d – The Selector creative style positively correlates with conscientiousness, to a greater extent than with other personality traits.	Partially supported
	2e – The Supporter creative style positively correlates with agreeableness, to a greater extent than with other personality traits.	Partially supported
	2f – The Stimulator creative style is positively related to perceived levels of performance at the idea generation stage; it will show a stronger relationship with idea generation performance than other creative styles.	Partially supported
	2g – The Spotter creative style is positively related to perceived levels of performance at the preparation stage; it	N/A*

	will show a stronger relationship with preparation performance than other creative styles.	
	2h – The Selector creative style is positively related to perceived levels of performance at the task presentation stage; it will show a stronger relationship with task presentation performance than other creative styles.	Not supported
	2i – The Selector creative style is positively related to perceived levels of performance at the idea validation stage; it will show a stronger relationship with idea validation performance than other creative styles.	Partially Supported
	<b>2j – The Selector creative style is positively related to perceived levels of performance at the outcome assessment stage; it will show a stronger relationship with outcome assessment performance than other creative styles.</b>	<b>Supported</b>
	<b>3 - Creative style(s) accounts for a significant amount of additional variance in creative/innovative performance beyond that explained by the personality traits alone</b>	<b>Supported</b>
2 - Is an individual's creative style changeable over time and which factors contribute to such changes?	4a – There will be a significant decrease in Stimulator creative style following experience of negative work-life event(s) in the preceding six months.	Not supported
	4b – There will be a significant decrease in Spotter creative style following experience of negative work-life event(s) in the preceding six months.	Not supported
	4c - There will be a significant decrease in Sculptor creative style following experience of negative work-life event(s) in the preceding six months.	Not supported
	4d - There will be a significant decrease in Selector creative style following experience of negative work-life event(s) in the preceding six months.	Not supported
	4e - There will be a significant decrease in Supporter creative style following experience of negative work-life event(s) in the preceding six months.	Not supported
	4f - There will be a significant increase in Stimulator creative style following experience of creativity training in the preceding six months.	Not supported
	4g - There will be a significant increase in Selector creative style following experience of starting an educational course in the preceding six months.	Not supported
	<b>4h - There will be a significant increase in Supporter creative style following experience of being promoted to a leadership position in the preceding six months.</b>	<b>Supported</b>

\*The preparation measure of performance was not used in the research due to inadequate reliability in the measure



## 4.5. Discussion

This chapter will discuss four main areas regarding ‘Study 1’:

1. The theoretical implications of the study findings – specifically those implications that are especially relevant to this piece of research in particular. To avoid repetition, theoretical implications relating to the research of creative style more broadly will be touched upon here, but discussed in a more appropriate level of detail in the main thesis discussion chapter (section 6.1).
2. The practical implications of the study findings – again study specifics will be discussed, with broader implications for creative style as a construct discussed in greater detail in a later chapter (section 6.2).
3. The recognised limitations of the study, both in terms of scope and methodological design.
4. Future research suggestions which are specifically borne out of these study findings. Broader research suggestions in the area of creative style will be discussed in a later chapter (section 6.4).

### 4.5.1. Theoretical implications

Firstly, it is suggested that theoretical implications of the research fall into two themes; our understanding of creative style as a construct, and where creative style fits in the wider theoretical landscape. In terms of our understanding of creative style as a construct, it has been mentioned that this is a relatively under-researched area – that has been no accepted definitive definition of what creative style is, no consistency in terms of what measures of creative style actually measure, and no consensus on the nature of creative style over time or its predictive validity when considering creative and innovative performance. Though being far from conclusive, the current research goes some way to addressing, or at least moving the research in a positive direction, in relation to these points. The theoretical implications of the research in these areas will be discussed in this chapter, split into subsections addressing each research question and associated hypotheses.

#### Research Question 1

**How robust is the Creative ID measure of creative style, and to what extent can creative style explain variance in performance at different stages of creative/innovative process beyond that which can be accounted for by personality traits alone? Hypotheses 1-3**

Until now, the research on creative style has been limited to studies proposing or reviewing a measure of creative style (not unlike the current research) and have inevitably defined the construct in a way which aligns to their respective measure (either in terms of adapting/innovating, or problem solving i.e. Kirton 1976, 1987, 1999; Puccio 2002). However, the difference between the current research and what has gone before lies in the links to established theory. The current research does propose a measure of creative style, but this is a measurement level consideration – when taking things back up to the construct level, creative style needs to be considered in terms of the wider creativity and innovation literature, and in doing this the current research defines creative style in a broader way, encompassing a greater variation of preferences and behaviours which fit with established theory. To recap, the definition of creative style proposed by the current research is:

*‘Creative styles are individual cognitive or behavioural modes or approaches in which people attempt to be creative and/or innovative – that is, in their attempts to generate novel ideas and implement new ideas, which could include problem/opportunity identification, the introduction, adoption or modification of new ideas, promotion of ideas and practical implementation’*

This definition is intended to be broad in its scope of relating to behaviours and ways of working that can relate to both creativity and innovation as defined by Anderson et al. (2014) and Hughes et al (2018), as well as being specific enough that it aligns to the creativity relevant processes incorporated in the Dynamic Componential Theory (Amabile & Pratt, 2016). In establishing the suitability of this definition, it is important to both ensure that the measurement tool being used is robust in terms of reliability, and also that it demonstrates validity in such a way that it aligns to established theory in the hypothesised manner.

Firstly, Hypothesis 1 stated that the Creative ID measure of creative style fits a five-factor model structure aligning to the posited dimensions. Following some amendments to the tool in terms of item removal, results (chapter 4.3.3) of the EFA and CFA support this hypothesis – implying, based on the data collected, that the tool measures five distinct creative styles at a suitable level of distinction. This in itself represents a theoretical contribution – as mentioned previously (section 2.2.4), other measures of creative style have not achieved acceptable factor structures beyond the four-factor structure achieved by FourSight, implying that the Creative ID tool (in line with the broader definition of creative style) adds further depth and rigour in the measurement of this multidimensional construct. Furthermore, the additional fifth ‘style’ not covered by previous measures such as FourSight, can be identified as the Supporter style which focuses on supporting and developing others in their pursuit of creative outcomes. This ‘other-focus’ has not been incorporated into previous definitions or measurement of creative style, yet fits the description of ‘creativity relevant processes’

in the Dynamic Componential Theory – therefore, bringing about the opportunity to further explore the currently isolated creative style research as a valid contributor to the wider creativity and innovation literature, which would be considered a further development of, and contribution to, theory.

Moving on to Hypotheses 2a-j, these made predictions regarding the relationships between creative styles and personality traits, as well as the prediction of creative/innovative performance from creative styles. In terms of construct validity, the hypothesis proposing correlations between creative style and personality traits were all supported or partially supported (Table 4.32) providing support at the measurement level for how each creative style is measured in the Creative ID tool, in that they relate to personality traits in the way which would be expected based on their definitions, and in line with previous research (Becker 2009, Rabbetts 2010). In terms of criterion/predictive validity, previous research has distanced creative styles from creative outcomes, stating that considering relationships between the two is largely irrelevant (section 2.2.1). The position of the current research is that it understands this view – that every individual has their preferred style, regardless of their ability – however, in order to integrate creative style into the wider literature and theory of creativity and innovation, we need to consider what the purpose of measuring creative style is, if not to better understand creative outcomes. In addition to this, there is a logical connection between what an individual prefers to do, and what they are good at doing. Furthermore, it is recognised that when considering where the construct of creative style fits within the wider theoretical literature, the Creative ID tool is just one measure of creative style – other measures (as outlined in section 2.2.4) have already found relationships between creative style(s) and personality traits (e.g. von Wittich & Antonakis, 2011), whilst others have found relationships between creative styles and elements of performance such leadership practices (Isaksen et al., 2003), divergent thinking (Basadur, 1998) and creative problem solving (Puccio et al., 2004) – yet, for the purposes of the current research and associated outcomes, the Creative ID tool and the creative styles defined within, are used. This could be considered a broader measure of creative style than has previously been used, expected to reliably measure a greater number of distinct styles, focusing on both the individual and others whilst being relevant to the entire creative/innovation process. Therefore, it is expected that theoretical contributions arising from this research would be building upon the previous body of research, rather than contradicting or opposing those findings – as has been noted to date, creative style as a construct (no matter the measurement method) shows a level of construct convergence with personality traits. Following further future research using alternative measures of creative style, it is reasonable to

propose that creative styles measured by other tools would also fit the theoretical frameworks identified in the current research.

The current research has aligned different creative styles to different creative/innovative stages as set out in the Dynamic Componential Theory (Amabile & Pratt, 2016) in an attempt to identify the creative styles which best fit, or are fit for purpose, at each stage of the creativity/innovation process. In doing so a number of the hypotheses relating creative styles to creative/innovative performance were supported, yet not all. Specifically, the Stimulator creative style significantly and positively predicted idea generation performance which would be expected given the preference for this creative style to come up with many ideas – however, the Spotter creative style was actually a stronger predictor of this performance. One possible reason for this could be that the Spotter creative style is associated with identifying opportunities early in the creative process and therefore, although the creative style itself does not directly reference the generation of ideas – the preference for spotting opportunities may result in the behavioural outcome of generating ideas related to those opportunities. In other words, the idea generation performance may be achieved through different mechanisms – with the Stimulator creative style providing the preference for this activity directly; and the Spotter creative style providing the opportunity to engage in idea generation after engaging in their preferred behaviour of spotting opportunities. Finally, it must be noted that in comparing the results of the current research to the previous MSc level studies conducted using previous versions of the Creative ID tool – when looking at self-report measures of idea generation creative performance (the only directly relatable dependent variable to the current research), both Becker (2009) and Rabbetts (2010) found that in addition to the Stimulator and Spotter creative styles; the Selector creative style also had a positive relationship with idea generation performance – this relationship was not observed in the current research. This lack of significant relationship could be explained through the less rigorous methodology utilised by the MSc students which firstly only collected data at a single timepoint and could therefore be subject to a greater level of common method bias whereby measures taken at the same timepoint are more in agreement, regardless of the ‘true’ underlying relationships – additionally the current research controlled for personality traits in its analyses which, had the MSc research studies done so, could have potentially impacted upon the significant Selector relationship noted.

Finally, as proposed by Hypothesis 3, creative styles were seen to account for a significant amount of variance in creative/innovative performance, beyond that explained by personality styles. Specifically, every regression model was significant at the  $p < .05$  level once creative styles were added, after controlling for demographic variables and personality traits; additionally, the specific creative styles

seen to relate to performance at specific stages of the creative/innovative process are detailed previously (section 4.3.8). This is a theoretical development in that creative styles are aligned to, and can predict, creative performance using performance measures that are aligned to the Dynamic Componential Theory, therefore providing support for creative style to be included in this model as a 'creativity related process'. Additionally, the research results indicate that although creative styles do correlate with personality traits (as they were hypothesised to do), they do add more predictive power and therefore are not so closely aligned that the measurement of creative styles is redundant which addresses the concerns in this area raised by von Wittich and Antonakis (2011).

## **Research Question 2**

### **Is an individual's creative style changeable over time and which factors contribute to such changes? Hypotheses 4a-h**

Overall, the findings of this study indicate that over time, creative styles were generally seen to be stable and unchanged when considering the entire research population, this was the case for four of the five creative styles measured. However, an increase in the Spotter creative preference was observed over a six month period for the research population as a whole; to clarify, when comparing the Spotter creative style scores from time 1 and time 2 for the entire research population, these mean scores were considered to be significantly different. Overall, this implies that most creative styles were stable and relatively not changeable over time, with the exception of the Spotter.

Taking a more nuanced look into how creative style may change over time in relation to the experience of specific work-life events, the current research did not find evidence to support the hypothesised effects of an individual's creative style changing over time as proposed through hypotheses 4a-g – however, it was found that the Supporter creative style increased over time following the experience of being promoted to a leadership position, as hypothesised (Hypothesis 4h). This implies that in a relatively short period of time (maximum 6 months) following the promotion to a leadership position, an individual demonstrates a significant increase in their levels of the Supporter creative style preference. In line with the hypothesised relationship, this may be due to the fact that once they are in a leadership position, the individual is expected/required/needs to take more of an 'other focus' in their work to ensure that they are not just performing at an individual level, but ensuring that their immediate team is also performing to the required levels and standards. Additionally, although not specifically hypothesised, this impact of experiencing a promotion to a leadership position had the same impact across all five of the creative styles over time in terms of a significant positive relationship

– whereby the experience of being promoted to a leadership position predicted an increase in each respective creative style.

When looking at regression analyses to determine which work-life events may predict a change in creative style at time 2 – adding work-life events into the regression model did not account for a significant amount of variance in creative style change according to the  $R^2$  model statistics, however, for each of the five creative styles measured, the experience of being promoted to a leadership position was seen to be a significant positive predictor. This effect of ‘promotion to leadership’ was significant beyond the demographic measure of ‘having leadership responsibility’ – this implies that when accounting for variance in creative style change, there is a difference between ‘being a leader’ and ‘being promoted to leadership’; this suggests that it may not be the title, status or even role expectations that are the underlying mechanisms for change, but possibly something more related to the promotion event itself – therefore, as outlined in the suggested areas for future research (section 4.5.4) it would be beneficial to untangle the elements of ‘promotion’ from ‘leadership’ to better understand the factors which are actually accounting for the variance in creative style change over time. Though the current study was not set up to delve into the depth required to tease out the mechanisms and relationships which may be present in the relationship between leadership and leadership behaviours with creative style, this is something that ‘Study 2’ in this thesis will look to address in more detail through the exploration of leadership style.

In terms of theoretical implications and contribution, these findings cannot conclusively add a definite characteristic of changeability (or not) over time with boundary conditions to our understanding of creative style – however, it has highlighted the possibility that in general creative styles (four of the five measured) appear to be stable and relatively unchanged over time – with the exception being the Spotter creative style. This adds support to the notion that creative styles behave in a similar manner to personality traits over time, in that they are considered to be generally stable and unchangeable, yet over time there are trends in which certain traits (notably agreeableness) increase over time (Costa et al., 2019). Additionally, the Supporter creative style did increase for those participants who experienced promotion to a leadership position in the preceding six months – again, this mirrors the research into personality traits highlighted in section 2.3.4 which highlighted how certain traits which are considered stable, can change over time following the experience of specific work-life events (e.g. Leikas & Salmela-Aro, 2015).

As will be discussed in the limitations section of this chapter (section 4.5.3), a greater number of data points over an extended length of time would be beneficial in order to better understand the nature of creative style over time and which factors influence any changes. Additionally, future research should consider the multiple mechanisms by which a 'change' in creative style over time could be detected – this could be (as this thesis has hypothesised) through the expectation/need/requirement for an individual's creative style to change over time based on their experience of work-life events and the new context they find themselves in (e.g. Boyce et al., 2015; Specht et al., 2011) – essentially changes that can be attributed to specific events and moments experienced; alternatively, there could be additional mechanisms such as continuous learning or skill development that happen gradually and more steadily influence an individual's styles, possibly over greater periods of time.

#### **4.5.2. Practical implications**

When considering the practical implications of the current research findings, the clear application is the development of a robust measure of creative style which fits a five-factor model as hypothesised. This tool was originally a 40-item tool prior to the current research, and through the process of exploratory and confirmatory factor analyses, has been reduced to a smaller 19-item measure which achieves better model fit statistics. This not only provides practitioners wanting to better understand the creative style preferences of themselves or others with a more robust tool which can be relied upon, it is now a shorter tool which is more convenient and attractive to complete. In terms of the current research finding that creative styles can explain a significant amount of variance in creative/innovative performance (beyond that accounted for by personality alone), this has practical implications for person-role fit, and person-task suitability. For example, the Stimulator and Spotter creative styles were found to be both positively correlated with, and significant predictors of, idea generation performance. Therefore, if you are recruiting for a role that requires idea generation, considering the creative style preference of your candidate may be a beneficial activity to undertake in the hiring process. Alternatively, if an idea generation opportunity arises in an organisation, seeking the input from those with higher Stimulator and Spotter creative style preferences in the organisation may contribute to more beneficial outcomes. However, it is important to note that all of the responses to the research questions were self-report measures of performance, rated on a Likert scale. Therefore, although the 'significance' of the results discussed are statistically significant, the practical significance is more difficult to quantify without objective measures. We currently do not know how much profitability, efficiency or time savings are obtained from a high creative style preference, only that the self-perceived performance is higher on the scales used to measure it.

#### 4.5.3. Limitations

In the case of the current research, it is largely parts of the research methodology which could be considered limitations. Firstly, in terms of the measures used – one of the aims of the research was to assess a relatively new and unpublished measure of creative style. Although some research had been done to assess the reliability, validity and factor structure of this tool, the MSc projects were limited in their scope (as discussed in section 2.2.5) resulting in a tool which was less rigorously tested than other published tools. The current research set out to address a number of the methodological shortcomings of the previous research into Creative ID. It is also recognised that in terms of the specific wording of items in measures of creative style – including the KAI and, to a lesser extent, Foursight – can include terminology that could be interpreted as measuring performance, rather than strictly tendency or preference. For example, the KAI item scoring is labelled from ‘very hard’ to ‘very easy’ in relation to how difficult it would be for the individual to maintain certain behaviours – this in itself hints at a link to ability in terms of how easy or able something is to achieve. Then the items are worded in a way to include phrases such as ‘*Is able to...*’, ‘*Masters...*’, and ‘*Copes with...*’ which suggest ability or performance; as well as ‘*Never acts...*’, ‘*Will always...*’ and ‘*Often...*’ which suggest a measure of frequency or regularity. It is acknowledged that the Creative ID tool also includes items which could be interpreted as tapping into performance rather than purely tendency or preference – there is undoubtedly an overlap between what people prefer to do in the workplace (*I like, I prefer, I enjoy*), what they are good at (*I can, I am able to, I am good at*), and what they do often (*I often, I regularly, I tend to*); untangling and defining these factors is worthy of research in its own right – it is a challenge to ensure that any measure of creative style taps into style alone, and this thesis acknowledges that, just like the KAI and others, the latest version of the Creative ID tool is not perfect in this regard. It is a development point for the next version (Version 5) that will be addressed at a later date along with further feedback provided as a result of the analyses presented in this thesis.

As an aside in relation to the development and improvement of the Creative ID measure of creative style, it is noted that the hypothesised five-factor solution was not the initial factor solution suggested by the EFA based on the full 40-item measure. As illustrated in Table 4.5, the initial suggested solution was that of seven factors, from which the decision was made to remove items which loaded onto ‘spurious’ factors. The factors identified as being spurious were those marked as factors 1 and 6 in Table 4.5 – for completeness these two factors should be revisited in case they provide valuable information in terms of future factors which could/should be included in the measure to ensure a more comprehensive measure of creative style is achieved. Factor 1 included the items ‘*I easily identify potential ideas from only small amounts of information*’ and ‘*It is easy for me to develop half-*



*formed ideas further* – logically, these items would seem to tap into an underlying construct relating to taking something relatively unformed and seeing how it could be beneficial in the future. However, this notion of spotting opportunities (Spotter creative style), building upon existing ideas (Sculptor creative style) and keeping in mind future goals and objectives (Selector creative style) could be considered to be adequately covered by the creative styles already identified. Therefore, it has been decided that this identified factor is indeed ‘spurious’ and due to the inaccuracy of measurement, rather than a gap in the theoretical scope of the construct. The identified ‘Factor 6’ included four items: *‘I am good at building on an existing idea to make it even better and stronger’*, *‘When making decisions, I use hard facts as well as my intuition’*, *‘I always review my decisions as it helps me make better ones in the future’* and *‘I offer support and guidance when a team member hits a barrier on a project’*. When reflecting upon these items, they seem to include a combination of underlying themes relating to decision making, improvement, evaluation, use of intuition and supporting others – there is no obvious single measurement construct which they seem to be tapping into, so again, it is determined that this is a spurious factor rather than a valuable element of creative style which has been overlooked and should be accounted for in future versions of the measurement tool.

In the case of measuring creative/innovative performance, as explained in the methodology chapter (section 4.2.3) this scale was brought together from three separate sources which had not been used together previously as a performance measure. Though the current research successfully amended this scale to achieve a statistically acceptable measure of performance, it was at the cost of losing an entire ‘factor’ (the measure for Preparation) and therefore the final measure used in the research does not align as closely to all stages of the creativity/innovation process as had been the intention. This leads to a strong recommendation for future research that the performance scale used undergoes further research and validation with larger sample sizes to improve reliability and factor structure, whilst also (where possible) reintroducing items aligning to the Preparation stage of the creativity/innovation process. Furthermore, it is recognised that the performance measure is subjective; this decision was made based upon the expected participant population who would be from multiple different organisations and sectors and therefore it would be very difficult to find an objective measure of performance which would be relevant to each individual and workplace. It is acknowledged that idea generation or remote association tests are often used in similar research, yet the decision was made to avoid these tests due to the nature of their outcomes only aligning to one of the stages of the creativity/innovation process. Therefore, it is accepted that the findings in relation to performance outcomes need to be considered in the relevant context of a subjective, self-report measure and it would be suggested that future research seeks to obtain access to larger samples from

single, or similar, organisations where objective measures of performance can be used in a meaningful way.

In terms of establishing validity of the chosen measure of creative style, it is acknowledged that the methodology does not allow for the obtainment of evidence for the full validity structure put forward by Hughes (2018). The research included the opportunity to obtain evidence of structural validity (through the CFA analysis of the factor structure), content validity (through the more in-depth measurement of the construct to more comprehensively capture the construct, compared to alternative measures), convergent and discriminant validity (through correlations with personality measures), predictive validity (through the regression analyses of time-separated data on creative style and creative/innovative performance) and incremental validity (through the regression analyses exploring variance accounted for in creative/innovative performance by creative style, beyond that accounted for by personality traits). Though this is considered to be a considerable range of evidence sources, this still leaves a number of areas which could be incorporated into future research, such as; response processes (looking at the specific mechanisms underlying participant responses), stability across groups, known groups (testing the measure on groups known to be high or low in a particular area), consequences (to consider the intended and unintended consequences of test use) and feasibility. In any further studies looking to establish psychometric accuracy and/or appropriateness, it would be advised that the methodology of such research bear in mind as many areas as possible from this framework to ensure the measures being assessed are as robust as possible, with a solid framework of validity to back up such claims – this could involve including the exploration of underlying mechanisms such as motivation or self-efficacy; including multiple participant groups (those in typical ‘creative roles’ such as marketing, innovation, advertising; as well as those not typically associated with creativity such as lawyers and accountants); and/or building in additional future time points to better explore stability over time and consequences of the measure on performance.

A limitation of the research into the changeability of creative style over time would be the number of timepoints data were collected at, as well as the duration of the study overall. The reasons for employing the methodology of two timepoints over a six month period have been discussed in depth (section 4.2.1), however, it is recognised that the research on personality traits changing over time often only found significant results after a period of 2-4 years or more (e.g. Wu, 2016; Wu et al., 2020; Leikas & Salmela-Aro, 2015; Costa et al., 2019). A longer study duration would enable the research to pick up on such changes which may need longer than six months to take effect. Regarding the number

of timepoints, having just two can only provide insight into a linear relationship – we currently do not know if creative style preferences over time vary from month-to-month, or year-to-year, and what curvilinear shapes those changes may take. Furthermore, it would be interesting to know whether any observed changes in creative style preference over time were maintained, or whether there is a spike before returning to an individual's 'normal' level. There is much to learn about the nature of creative style over time, and having multiple time points over a sustained period of time would be key to unearthing this understanding.

Finally, a potential limitation of this research is the possibility of sample bias – it should be recognised that the historical data used came from the clients of Creative Creatures, collected through delivering their services as a creativity consultancy. Therefore, it could be reasonably assumed that a large proportion of this population would be employed by organisations, and be performing in roles, that lend themselves to hiring a creative consultancy for creativity consulting and training services i.e. those already with an interest or specialism in creativity in areas such as marketing, advertising, innovation and other similar roles, organisations and sectors. This, in terms of the responses to the creative style measure and the creative/innovative performance measures could potentially be higher than would be expected from a more representative sample of the general population. Furthermore, when looking at the change in creative style over time, the research population for this research was primarily obtained through an online platform (Prolific) – although reasonable steps were taken to filter the participant population to ensure that the research was applicable to them (i.e. adults in employment), the profile of people who sign up to such a platform to complete academic questionnaires in their spare time in return for payment may not be representative of the general population in their views or ways of working. These considerations should be taken into account when making any inferences regarding the generalisability of the presented research findings.

#### **4.5.4. Future research suggestions**

As stated at the start of this chapter, this section will outline future research suggestions with specific links to the findings and/or limitations of the current study. More broad suggestions for future research will be covered in the main discussion chapter (chapter 6). Following on from the limitations of Study 1 discussed above three specific suggestions for future research will be suggested.

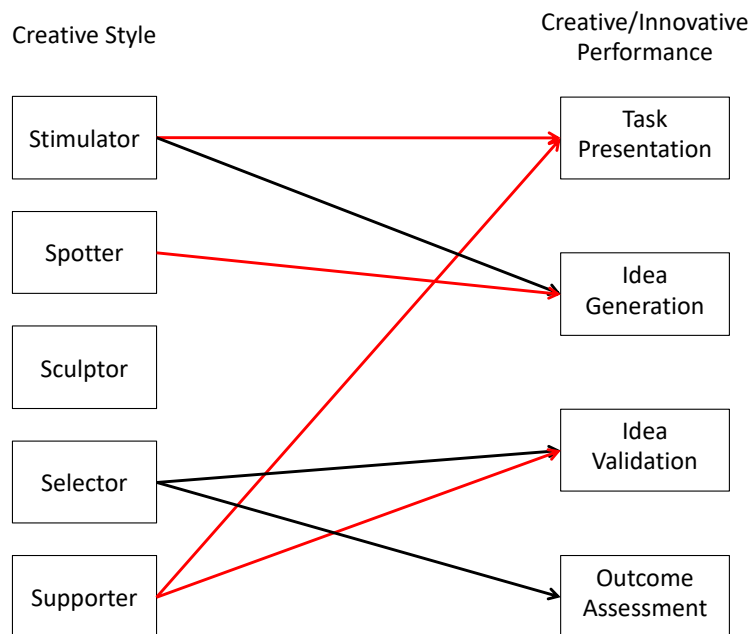
Firstly, to better understand the predictive validity of creative style preference in relation to creative/innovative performance, it would be advised to obtain organisational access to one, or a number of similar, large organisations. By similar, this refers to industry and sector, whereby

meaningful objective measures of performance can be utilised. For example, the stages of the creative/innovative process – *task presentation, preparation, idea generation, idea validation, outcome assessment* – could be objectified by measuring the number of opportunities identified (task presentation), the time/resource taken to prepare (preparation), the quantity of solutions generated (idea generation), the quality of solutions generated (idea validation) and the overall benefit to the organisation of the chosen solution (outcome assessment). In the current research, these metrics would not have been suitable, as the numerical values obtained from such measures would not be comparable across creative industries, academia, law and finance (for example). Of course, participant sample size and statistical power is important, hence the suggestion for one (or more) large companies to obtain a suitable sample size. The research suggestion would then be to replicate the current research findings, to explore how much variance in creative/innovative performance can be explained by creative style preference, in addition to that accounted for by personality traits. This would involve at least two timepoints to ensure that creative style at time 1 is predicting performance at time 2 (and beyond), though a longitudinal study over multiple timepoints would allow for greater depth of insight, whilst potentially incorporating more meaningful ‘outcome assessment’ measures relevant to the organisation/s or participants in the research. A study with this design would be well placed to indicate more tangible outcomes in terms of the performance measures – stating that a 1 point increase in a creative style preference equates to X more opportunities identified, X more ideas generated, or £X more income/savings to the organisation over a certain time period. Multilevel modelling could also be implemented for this research to look at any organisational level factors which impact upon creative style – it may be the case that different industries, sectors, or individual organisational cultures foster different creative style preferences. Additionally, it would be beneficial to better understand the wider construct of creative style, to use multiple measures of creative style (including the Creative ID, KAI, FourSight etc.) to further our understanding of where these measures overlap, where one provides additional insight over the others, and where they all have predictive validity in terms of creative/innovative performance and relationships with other constructs. Unfortunately, due to copyright, licensing and intellectual property restrictions, the collection of data in the current research was not able to utilise KAI, FourSight or any other measures of creative style alongside Creative ID due to them either being not openly available for research purposes, or requiring a significant investment in both time and money to become certified and licensed in such measures.

From a theoretical perspective, positive relationships between creative styles and creative/innovative performance at the individual level were identified in Study 1 as illustrated in Figure 4.3. The relationships indicated in black are those which were expected based on the existing literature, with

support provided for the associated hypotheses. The relationships indicated in red were also found to be significant in the research findings. The positive relationships between the Stimulator creative style and idea generation performance; and the Selector creative style with both idea validation performance and outcome assessment performance were expected, with the associated rationale provided previously (section 4.1.1). In terms of the additional relationships observed – the Stimulator creative style was seen to positively relate to task presentation performance, implying that people who come up with ideas and think divergently would perform better in activities that involve selecting the right task or opportunity to pursue, determining why this is and presenting this opportunity – on reflection, this stage of the creative/innovative process would benefit from some ‘out-of-the-box’ divergent thinking, especially if the opportunity to be creative/innovative is not immediately obvious and ideas of how to get started need to be generated. The Spotter creative style was seen to be positively related to idea generation performance – this is not a surprise as the Spotter creative style represents spotting links and connections between things, especially in terms of identifying which ideas are potentially the most promising or valuable. As such, this creative style preference is linked to the idea generation process, though was (correctly) not hypothesised to be the creative style with the strongest link to this stage of the creative process, with that being the Stimulator. Finally, the Supporter creative style was found to be positively related to both task presentation performance and also idea validation performance – this implies that people that support and motivate others to achieve higher levels of performance actually perform better themselves on tasks that involve selecting which tasks to pursue and also logically assessing the quality of ideas produced against task criteria. Theoretically, this may be the case as these are the stages with more of an ‘other-focus’ – task presentation may involve selecting opportunities for others to work on, or opportunities for the individual with the Supporter preference to collaborate with others; while idea validation may involve the judging and assessing of ideas which have been produced by others. In contrast, idea generation is often a very self-focused activity, and outcome assessment relies on logic and evaluation of a process. Further research would be required to better understand whether these results could be replicated in a separate participant sample (something which Study 2 presented in this thesis is well positioned to address) before delving into the theoretical nuance of the mechanisms by which these relationships occur.

Figure 4.3 – Illustration of identified relationships from Study 1, including expected relationships (black) and additional (red)



Furthermore, taking Amabile & Pratt’s (2016) Dynamic Componential Theory (DCT) as a framework of reference, the current research goes some way to establishing that some creative styles can have positive relationships with some stages of the creative/innovative process – in fact, the DCT only states that creativity relevant processes have an impact on stages 2-4 (preparation, idea generation and idea validation); with task presentation (stage 1) impacted by motivation and outcome assessment with no direct theorised relationships. Therefore, given that some evidence has been found for creative style(s) relating to all stages measured in this research – this begs the question of whether the structure of the DCT should be reconsidered in terms of the impact creativity relevant processes can have on the creative/innovative process; or, whether we should conduct further research into creative style’s relationship with creative/innovative performance alongside other predictors in the DCT such as motivation and relevant skills to determine exactly how much variance in performance is explained by creative style alone after accounting for the other constructs in the model. Therefore, this brings about a suggestion for future research, largely following the structure and methodology of Study 1, yet including measures of intrinsic motivation, extrinsic motivation and creative skills (in relation to idea generation, informational gathering, assessment and decision making) which align to the creative/innovative stages. This would build on the existing research to test creative style within a more comprehensive version of the DCT, whilst determining how creative style best fits the model relative to the other established factors.

The second future research suggestion involves improving upon the methodology employed in Study 1 to better understand the changeable nature of creative style over time. Very simply, this would involve a longer study period (suggested 5 years, to better align with the research into personality traits which have observed change over time e.g. Wu, 2016; Wu et al., 2020, Boyce et al., 2015), with a greater number of data collection timepoints (beyond the two used in the current research design). As previous discussed, this would allow more time for the changeability (if any) to become clear, either due to the effect of age, time in a role/organisation, or through the experience of one or more work-life events. A more structured design could be implemented to explore work-life events such as the experience of creativity training, actively seeking out a participant sample that are due to attend such a course and assessing them before and after. This could also be achieved in relation to the experience of being promoted to a leadership position – if there is a large enough sample available of people who are undergoing leadership training, or a graduate scheme whereby the successful completion results in the participant moving into a position of leadership, this event can then be predicted and again, a before and after assessment would be possible. The additional data collection points would allow for the examination of curvilinear relationships over time and would better indicate whether any observed changes over time were due to the experience of certain work-life events, and if such changes are temporary before reverting back to a previous level, or alternatively are maintained over time.

At a theoretical level, it would be beneficial to gain a deeper understanding of the mechanisms by which a promotion to leadership position relates to a change in an individual's creative style over time – given that being in a leadership position was not found to be a significant predictor of a change in creative style over time, the findings of Study 1 imply that it is the 'promotion' element of the work-place event experience that is of most interest. Therefore, another suggestion for future research would be to explore participants who are promoted into leadership positions, as well as participants who are promoted into non-leadership, or more junior positions. In addition to this, factors which may be related to the experience of a promotion and should also be measured to better understand the underlying mechanisms – a thorough review of the existing literature would be required to make hypotheses grounded in theory and literature, these factors may include; intrinsic motivation (considering career-progression as something 'inherently enjoyable' – e.g. Ryan & Deci, 2000), extrinsic motivation (obtaining a 'separable outcome' i.e. an example of gaining power, status, recognition or reward – e.g. Ryan and Deci, 2000), self-efficacy (e.g. Dimotakis et al., 2017) and increased work demands (own performance, performance of others, innovation e.g. Herttalaampi et al., 2023).

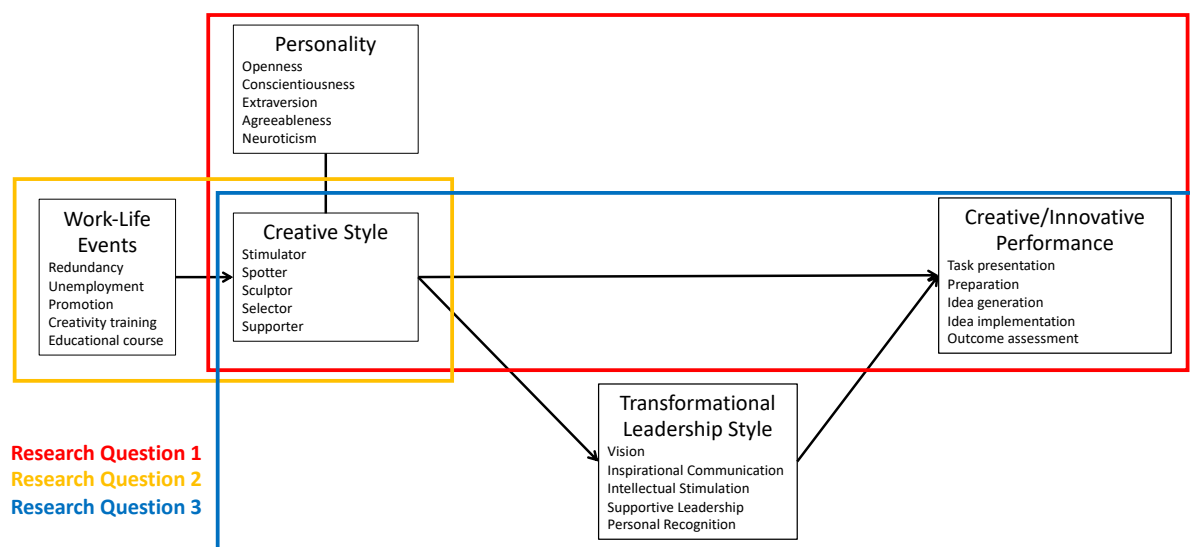
Aside from observational studies where participants are directly observed, or asked for their participation, whilst going about their usual working routine – there is also the possibility of experimental studies where researchers could take the opportunity to artificially alter the context of individuals to explore whether expected changes in creative preference over time occur. It is suggested that future research utilise this approach in relation to the work-life events explored in Study 1 – specifically being promoted to a leadership position, the positive event seen to relate to the change in creative styles over time. It is recognised that a significant increase in the mean of the Spotter creative style over time was noted when participants experienced a period of unemployment, though actively and artificially attempting to enable participants to experience this event would bring about considerable ethical issues; therefore, it is recommended to focus upon the promotion to leadership experience. This could be achieved through putting participants into workplace simulations of leadership situations whereby they have a change in role and status (as they would in a genuine workplace scenario) whilst also becoming responsible for the performance of others. However, it would be challenging to ensure that all of the potentially underlying constructs (such as motivation and self-efficacy) are replicated accurately in a simulated situation – though this type of study design could bring about specific insights in a controlled manner across a shorter timescale which would provide a basis for further, more in-depth and generalisable research.

The final suggestion for future research is centred on creative style and leadership. Although leadership in itself was not a key construct of interest in Study 1, the results indicate that leadership status and the experience of recently being promoted to a leadership position, could contribute to the prediction creative style changes. It would be interesting to explore this more, looking into not only whether leadership status (yes or no) has an impact on creative style preference, but in more detail relating to the types of leaders through their leadership styles. There is a gap in the literature regarding how an individual's leadership style can be predicted (e.g. Sun et al., 2017; Koh et al., 2019) – if creative style is seen to predict leadership style, this would be a meaningful theoretical contribution to the literature, as well as having clear practical implications for industry. This will be the basis for Study 2, covered in this thesis, whereby leadership style and creative style are explored – using a multilevel study design gathering data from both leaders and their followers, relationships between creative style and leadership style will be explored, as well as investigating the impact a leader's creative style has on their followers' performance to further develop our understanding of the role creative style plays in predicting creative/innovative performance.



For clarity, in referring back to Figure 2.4 (recreated below as Figure 4.4) which highlights the proposed theoretical framework of the research, the findings and discussion points discussed in relation to Study 1 relate to Research Questions 1 and 2, illustrated by the red and yellow boxes in the figure. It is acknowledged that additional research, as outlined above, would be advised to design studies which test a more comprehensive version of both this theoretical framework (by expanding each study design beyond the confines of the current illustrated boxes) and that of the Dynamic Componential Theory. The following chapter will present Study 2, which addresses Research Question 3 incorporating the constructs highlighted in the figure by the blue box.

*Figure 4.4 – Proposed theoretical framework for the research*



## Chapter 5: Study 2

*Exploring the relationship between creative style and leadership style, and the implications for follower performance.*

### 5.1. Introduction

In this chapter, the second research study is presented. This study addresses Research Question 3: Does an individual's creative style relate to their leadership style, and how do these styles at the leader level relate to follower creative/innovative performance?

In addressing this research question, this chapter will first build upon the main literature review (chapter 2) to include additional research relevant to the specific research question being explored in this study, and to illustrate the development of the associated research hypotheses. The methodology of the study is outlined in terms of the research sample, data collection and measures included in the research. Then, the data analysis strategy is discussed, with an outline of the statistical analyses used and research results presented; before finally adding a brief discussion relating to the research findings in the context of the proposed research hypotheses.

As stated in the main literature review chapter, leadership – that is the “influence relationship among leaders and followers who intend real changes that reflect their mutual purposes.” (Rost, 1991, pp. 102–103) is a substantial area of the literature in itself, and this thesis is not in a position to do justice to a literature review on the topic. The small area of leadership that is covered in this thesis and the associated research is that of leadership style, which refers to the different styles in which an individual behaves as a leader, with the intention of achieving beneficial outcomes through their leadership actions – again, referring back to the main literature review, these can be defined as “patterns of informal and interactive behaviours that are believed to foster certain desirable or undesirable follower-, team-, or organization related objectives or consequences” (Fischer & Sitkin, 2023, p. 332). The importance of highlighting leadership styles in the current research is that certain leadership styles displayed by a leader (in particular transformational leadership) have been found to predict increased workplace performance in their followers (Tierney, 2008), particularly in terms of creative/innovative outcomes (Bono & Judge, 2003; Dong et al., 2017; Gong et al., 2009; Hughes et al., 2018; Lee et al., 2020; Ma & Jiang, 2018; Rosing et al., 2011; Shin & Zhou, 2003). It is unclear what predicts desirable leadership styles such as transformational leadership; the findings from personality and other traits have not been established and Koh et al. (2019) have called for more research into the “innovativeness” of leaders so we are able to better understand the creative/innovative

preferences and abilities of leaders as this may help to predict the emergence of leadership styles and the subsequent benefits for individuals and organisations. Furthermore, leaders as a participant population provide a valuable source of insight for creativity and creative style research – as mentioned above there are a number of existing links between leadership and follower creativity, and people in a leadership role not only have an impact over their followers in terms of creative/innovative performance, but could be assumed to have greater levels of expectation or requirement placed upon them in terms of problem-solving, strategic thinking and focusing on the needs and performance of others – all of which could potentially have implications for both creative style and leadership style. This makes the leadership population fascinating for creativity and creative style research, adding a perspective and relationship which cannot be accounted for in individual or team-level (i.e. working groups / colleagues / peers) research.

It is important to note here why, of the many leadership styles present in the literature, that transformational leadership has been selected to be the leadership style of choice for the current research. The comprehensive review papers in this area by Hughes et al. (2018) and Lee et al. (2020) note that both empowering and authentic leadership styles are actually seen to have stronger relationships with creative and innovative outcomes of followers than transformational leadership. However, as noted in the main literature review chapter of this thesis, a number of prominent authors in this field (including but not limited to Hughes et al., 2018; Lee et al., 2020; Fischer & Sitkin, 2023) note that there is a broader measurement issue with leadership style as a whole, in that various measures of ‘different’ leadership styles are so closely correlated and have similar predictive validity that they could possibly all be tapping into the same underlying construct relating to ‘good’ leadership. Specifically, they note that 12 of 13 leadership styles analysed (with transformational being the exception) all correlate positively with creative and innovative outcomes (Hughes et al., 2018). In some ways this could lead to the simple view that, at least until there is an accepted way forward in the accurate measurement of leadership style, the specific measure of leadership style to use in research no longer has such great importance, providing it is in itself a well-constructed measure deemed to be reliable and valid it should measure the element of ‘good leadership’ that it is proposed they all currently tap into.

It is therefore suggested that there are two main advantages to continuing to use transformational leadership as the measure of leadership style; firstly, the large body of existing research between this leadership style and creativity; and secondly, the level of depth and detail available in these measures. Firstly, because of the large body of research behind the measurement methods which has developed

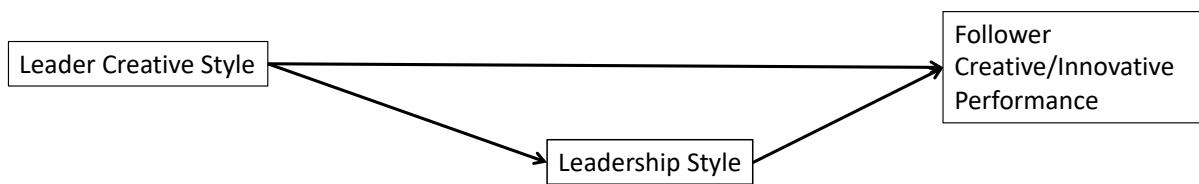
over time. As shown in the main literature review, transformational leadership is the most prevalent style used when predicting creative and innovative outcomes – criticisms of some popular measurement methods have resulted in newer tools being developed and validated. The methods have developed over time and the tools themselves are well regarded (see section 2.4.2 for further detail). The second identified advantage is that these newer tools are designed to measure the underlying facets of transformational leadership as independent scales, rather than combined into a composite measure over the overall leadership style. Specifically, this has been developed to combat the criticism of the Multifactor Leadership Questionnaire (MLQ, Bass & Avolio, 1997) and the underlying factor structure of this tool which Rafferty & Griifin (2004) look to specifically address with the Transformational Leadership Scale. This greater level of depth and specificity of measurement is appealing to research studies that are looking into more nuanced relationship between variables – the research of this thesis included. Whereas as many research studies would measure ‘creativity’ in a single scale (usually restricted to idea generation) the current research recognises that creative behaviour is much broader than this, and is therefore interested in creativity and innovation at different stages of the creativity/innovation process. In the same way, the current research acknowledges and understands the recent publications on leadership style questioning whether these styles are firstly distinct from each other, and secondly whether they should be measured as a composite overarching style or whether more nuanced sub-facets would be more beneficial. Therefore, this is a key reason for transformational leadership being incorporated in the current research, due to the fact that there is an existing, established measure of leadership style which was specifically designed to measure the underlying facets of transformational leadership independently, rather than relying on a broader composite measure.

Beyond the desire to identify which constructs predict leadership style, there are a number of mechanisms by which leadership style influences follower performance – each of which could logically align to the construct of creative style as well. For example, it has been noted that there are a number of factors which have been seen to mediate the relationship between transformational leadership and follower performance – these include, but are not limited to; follower intrinsic motivation (Shin & Zhou, 2003; Wang et al., 2016), support for risk taking (Asmawi et al., 2013; Shin & Eom, 2014) and follower autonomy (Basu & Green, 1997; Den Hartog & Belschak, 2012). These relationships all imply that a desirable leadership style such as transformational leadership positively impacts followers’ motivation, support for risk taking and followers’ autonomy, which all then impact positively upon follower performance. Theoretically, each of these mechanisms could also include creative style as a predicting factor – in particular, the supporter creative style incorporates a preference for improving

the motivation of followers, providing support and allowing others to work in a way that best suits them. Beyond this, the stimulator creative style prefers to be prolific in terms of coming up with ideas and opening up opportunities for new ways of working – these things put it in alignment with transformational leadership - these facets of the style could also be motivational to followers, coming up with lots of divergent options likely opens up the acceptance of risk, and providing multiple ways forward and ways of doing things may increase followers' feelings of autonomy as they are less restricted in their working practices. A further theoretical angle to consider is that of social learning (e.g. Bandura, 1977) and leader role modelling. It could be argued that these provide a theoretical basis for a number of creative styles of a leader (i.e. Stimulator, Spotter, Sculptor and Selector) to impact the performance of followers, not in terms of specifically what they do in purposefully 'leading others', but by what they do in general, though given their position as a 'leader' these behaviours and preferences are more consequential due to the status and visibility of the leader. Social Learning Theory involves learning through a process of attention, retention, reproduction and motivation – stating that people learn through first paying attention to a respected figure and their behaviour, retaining this information before attempting to reproduce it themselves, with a motivational reason for wanting to do so. Due to the leader's potentially influential position, it would be reasonable to assume that they would be seen as an expert or role model who could be observed and emulated in terms of their behaviours, with either the intrinsic motivation of self-improvement or achievement, or the extrinsic motivation of recognition for their new behaviours/performance.

In terms of what is measured in Study 2, a comprehensive model of constructs including creative style, leadership style, follower motivation, follower perceived support for risk taking, follower autonomy and follower performance would have been preferred; however, given the lack of existing research and theory which specifically incorporates creative style, the current study has decided to focus on the mechanisms directly linking creative style, leadership style and follower performance as a way of building a basis for our theoretical understanding of this construct and, depending upon the results, as a foundation for future research to probe deeper into mediating relationships and more intricate mechanisms once the basics have been established. Based on these proposed relationships between the constructs, Figure 5.1 illustrates the proposed framework, with subsequent sections of this chapter outlining how research hypotheses have been developed to address each proposed relationship, and for each respective creative style, leadership style and measure of follower performance.

Figure 5.1 – Proposed theoretical framework for Study 2



## 5.2. Research Question 3

***Does an individual's creative style relate to their leadership style, and how do these styles at the leader level relate to follower creative/innovative performance?***

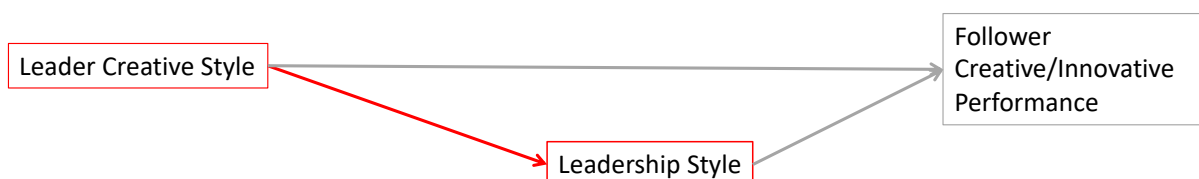
This broad research question focuses on the relationship between creative style and leadership style at the leadership level – as well as exploring how the creative and leadership style of a leader impact upon the performance of their followers. For clarity of the thesis, this research question will be split into two sub-questions relating to the relationship between creative style and leadership style (3a); and the impact on follower performance (3b).

### 5.2.1. Research Question 3a

***Does an individual's creative style relate to their leadership style?***

This section covers a brief overview of the relevant literature covered in (section 2.4) as well as adding further literature deemed relevant to this specific study. From this literature, as well as theoretical and logical inference, proposed relationships between creative style(s) and leadership style(s) can be put forward, leading to the formation of testable hypotheses.

Figure 5.2 – Theoretical framework with relevant relationships (leader creative style and leadership style) highlighted in red



As discussed in the main literature review chapter, no discoverable research has been identified which explicitly looks into the relationship between leadership style and creative style (section 2.4.4) However, logical inferences can be made based on the definitions of the creative styles and leadership style of interest in this study – namely, the creative styles of Stimulator, Spotter, Sculptor, Selector and Supporter; as well as the transformational leadership style and the subdimensions which contribute to it (vision, inspirational communication, intellectual stimulation, supportive leadership, personal recognition). Transformational leadership was chosen as the leadership style of interest in this research due to the ability to measure it at a level of depth similar to that of creative style, and due to this being the leadership style with the largest body of existing research in relation to creativity and creative performance.

*Table 5.1 – Definitions of creative styles and definitional alignment with the subdimensions of transformational leadership*

Creative style	Definitional alignment with subdimensions of transformational leadership style (Rafferty & Griffin, 2004)
<b>Stimulator</b> Generating streams of new and challenging ideas; a divergent & disruptive style.	Intellectual Stimulation Enhancing employees' interest in, and awareness of problems, and increasing their ability to <b>think about problems in new ways.</b>
<b>Spotter</b> Combining pieces of information, or seeing patterns and connections, to identify potentially beneficial opportunities; an abstract and intuitive style.	Intellectual Stimulation Enhancing employees' interest in, and awareness of problems, and increasing their ability to <b>think about problems in new ways</b>
<b>Supporter</b> Encouraging, offer guidance and otherwise get the best performance from others; empowering, collaborative and fostering an environment for growth	Inspirational Communication The expression of <b>positive and encouraging messages</b> about the organization, and statements that <b>build motivation and confidence.</b>  Supportive leadership Expressing <b>concern for followers and taking account of their individual needs.</b>  Personal recognition The provision of rewards such as <b>praise and acknowledgement of effort for achievement</b> of specified goals.

Regarding Table 5.1, it can be seen that when considering the definitions of creative style(s) and the subdimensions of transformational leadership, there are logical links to be made. Firstly, both the Stimulator and Spotter creative styles have a preference for new ideas and new ways of doing things – this links to the intellectual stimulation definition which refers to thinking about problems in new

ways. Secondly, due to the Supporter creative style's preference for encouraging others, offering guidance and otherwise getting the best performance from the people around them, this aligns it to three of the five subdimensions of transformational leadership. Specifically, inspirational communication due to the focus on encouraging messages that build motivation and confidence; supportive leadership due to the concern for others and taking into account their individual needs; and personal recognition due to the elements of praise and recognition of others in reward for the achievement of goals and/or desirable behaviours and performance. Additionally, it can be noted that neither the Sculptor or Selector creative styles, nor the vision subdimension of transformational leadership are considered to have substantial overlap with any other styles or subdimensions in the research based on their definitions. Neither a creative style preferring to build on the ideas of other (Sculptor) or make logical and convergent decisions (Selector) logically align to any of the subdimensions of transformational leadership; while expressing an idealised picture for the future does not obviously align to the definitions of the creative styles. Finally, considering the definitions of creative style(s) and subdimensions of transformational leadership, although Table 5.1 highlights the perceived similarities between creative styles and subdimensions of transformational leadership, and therefore the proposed positive relationships between them, it must be considered whether there are any potentially negative relationships whereby a higher level of a particular creative style preference would be associated with the lower level of a particular desirable leadership behaviour. Based on the definitions provided throughout this thesis, no negative relationships are expected between creative style(s) and the subdimensions of transformational leadership.

Is important to reiterate a point made earlier in this thesis regarding creative styles. In Study 1 it was noted that the Supporter creative style was not expected to be the most significant predictor of individual performance at any stage of the creative/innovative process due to the fact that this style (in contrast to *Stimulator*, *Spotter*, *Sculptor* and *Selector*) is not immediately aligned to the performance of the individual, but in enabling and supporting the performance of others. This makes the Supporter creative style of most interest in the current study, Study 2, as it is this focus on understanding, empowering and enabling others that creates a logical link with leadership and leadership style, whereas the other creative styles are strictly focused on pursuing and obtaining outcomes for the self. This is reiterated by the idea that the Supporter creative style may have links to three of the five subdimensions of transformational leadership. This brings about a question regarding the 'other' creative styles, the ones which are not the Supporter, and therefore not explicitly concerned with others, only of the self. By what mechanism could these creative styles (such as the Stimulator and Spotter mentioned above) have an impact on their followers by the way in which they



lead? This is where the previously mentioned Social Learning Theory and role modelling become influential – it is by these mechanisms that it is proposed a leader's creative style (i.e. the way they prefer to work in their pursuit of creativity and innovation) is observed by their followers – and in line with social learning theory, this observation of a more senior (and likely more experienced) figure is given sufficient attention that the information is retained and subsequently emulated. In the case of the Stimulator creative style, this would involve leaders coming up with many ideas to problems, or identifying new and interesting ways of overcoming problems – this, over a period of time would be observed by their followers, who would then retain this information in terms of the way their leader goes about problem solving (for example) and be motivated to act upon it and emulate the behaviour, with the leader having provided the intellectual stimulation component of transformational leadership somewhat unconsciously, though this would be perceived by followers.

In terms of predicting an individual's leadership style, this is something that has not been definitively established in the literature in terms of transformational leadership (Bono & Judge, 2003), nor other leadership styles. Although personality traits have been considered to be predictors of certain positive leadership behaviours and leader effectiveness (de Vries, 2012; Shahzad et al., 2020; Tierney et al., 1999), the findings are less conclusive in the case of transformational leadership style (Bono & Judge, 2003) with a call for more research in this area to determine whether other 'traits' could be the predicting constructs (Bono & Judge, 2004) – Sun et al. (2017) note that evidence in this area is still scarce with Rosing and Zacher's recent review chapter (2023) calling for more research in this area. Therefore, given the nature of creative style – considered to be related to personality, yet can explain additional variance in dependant variables such as performance and therefore should be considered distinct and not entirely synonymous with personality traits – it could be proposed that the creative style of an individual is a reasonable factor to consider in both correlating with leadership style, and accounting for variance in leadership style. Furthermore, the majority of previous research into creative style has only considered individual level factors and outcomes; yet those in leadership positions are often not only required to take on more creative/innovative responsibility themselves (as they need to problem solve, find ways of achieving team goals, developing and implementing strategies), they also become more responsible for the creative/innovative performance of their teams through their encouragement, leadership and management behaviours. This highlights the importance of considering creative style at the interpersonal level in terms of how leaders need to not just focus on themselves, but need an 'other focus' when it comes to their behaviours and working styles – what impact does the creative style of a leader have on the creative/innovative performance of their followers? And is their creative style related to their leadership style?

Looking into the definitions of creative styles and leadership styles – there is significant overlap between the Supporter creative style and desirable leadership styles such as transformational. Therefore, we must consider whether they are in fact measuring the same underlying construct, or something related yet separate. As discussed in a previous chapter (section 2.2.5 and 4.1.1), one of the main developments of the creative style construct suggested by this thesis is the inclusion of the Supporter creative style – when determining the patterns and preferences of thinking and behaviour in the successful pursuit of creativity and innovation, a key element deemed to be missing from previous measurement tools and definitions of the construct, is the supportive, leader-like, collaborative element with an ‘other focus’. This collaborative element that touches upon the social nature of creative work is something missing from other measures of creative style such as the KAI which focus entirely on the individual in isolation which is often not the case in real-world creativity and innovation. These more interpersonal aspects are also highlighted within the ‘creativity related processes’ which contribute to the attainment of individual and small group creativity in the Dynamic Componential Theory (Amabile & Pratt, 2016). The role or behavioural preference which an individual can undertake in order to not necessarily achieve creative/innovative output themselves directly, but to contribute to the overall process and success by coordinating, supporting and otherwise getting the best performance out of other individuals involved in the process. This undoubtedly aligns the Supporter creative style to transformational leadership, however, the definition of Supporting is broader than that of the leadership styles. Whereas the leadership styles are only applicable in a leadership context, the Supporter creative style and the preferred behaviours and approaches encompassed within this style, are applicable to any group or collaborative endeavour including, but not limited to, leadership roles. Another difference which can be highlighted between the Supporter creative style and that of a transformational leadership style, is working context – whereas the leadership styles are seen to be applicable to all working contexts and endeavours; creative style is only deemed to be relevant to the pursuit of creativity and innovation, hence the performance measures used in the present research are of a creative/innovative nature only. To clarify, the supporter creative style is expected to positively correlate with the desirable leadership styles, namely transformational. The differences in the constructs come from the leadership styles being specific to leadership roles but relevant to any working endeavour, whereas creative styles are specific to creative/innovative endeavours but relevant to all job roles and levels of seniority.

As Koh et al., (2019) noted, there is currently no discoverable research into the “innovativeness” of transformational leaders – meaning that we are currently unaware of firstly, what exactly predicts

transformational leadership styles; and secondly, the creative styles/preferences of those who are considered to have a transformational leadership style. The current research is not only well placed to address this in terms of a relationship between leadership style and follower creative performance, but also to take this a step further in exploring not just 'how much' creativity certain leadership styles are seen to achieve, but also how they prefer to do so in clarifying their creative style. Furthermore, Sun et al.'s (2017) review into the antecedents of transformational leadership categorises the suspected antecedents of this desirable leadership style as (1) the leader's qualities (including traits), (2) context factors, and (3) the leader's colleagues' characteristics. The present research is well placed to look at point (1) in this regard as it can be explored whether creative style is a potential antecedent to transformational leadership, noting that studies in this area of research "...are rare, an area that warrants future research." (Sun et al., 2017, p. 20). As noted in Section 2.4.4, it is theorised that the creative style of an individual could potentially be an antecedent to desirable leadership style primarily due to the chronological nature of how and when such styles develop within an individual. It is proposed that an individual's creative style – the individual cognitive or behavioural modes or approaches to work – would be developed relatively early in an individual's career once they join the working world and develop tendencies for certain working modes or approaches. It is generally later in an individual's career that they are promoted into leadership positions. Therefore chronologically, when the leadership style of an individual is formed, it is likely that their creative style (alongside other existing traits and preferences such as personality) has already been formed for some time and therefore could potentially inform how an individual develops their leadership style.

It must be acknowledged that the relationship between creative style and leadership style could potentially be reversed, with leadership style being the predictor of creative style, should it be found that creative style changes over time. Study 1 presented in this thesis is the only known research so far to specifically explore the nature of creative style over time, and although creative style is hypothesised to be relatively stable over time (as per the nature of personality), the results of Study 1 showed that one or more creative styles could change over time and this could be partly attributable to the experience of work-life events (again, in line with the literature on personality) – one such event could be the promotion to leadership. As explained in greater detail in the discussion chapter (chapter 6), substantial further research has been suggested in this area to further our knowledge of the nature and changeability of creative style over time; however, for the purposes of Study 2 (in line with the majority of research findings from Study 1), we will continue to consider creative style as relatively stable over time to the extent that it could be considered more 'trait-like' in the same way as

personality is considered; and therefore able, theoretically at least, to predict an individual's leadership style.

This brings us to the first testable hypotheses:

***Hypothesis 1a – The Stimulator creative style of a leader is positively related to the intellectual stimulation subdimension of transformational leadership.***

***Hypothesis 1b – The Spotter creative style of a leader is positively related to the intellectual stimulation subdimension of transformational leadership.***

***Hypothesis 1c – The Supporter creative style of a leader is positively related to the inspirational communication subdimension of transformational leadership.***

***Hypothesis 1d – The Supporter creative style of a leader is positively related to the supportive leadership subdimension of transformational leadership.***

***Hypothesis 1e – The Supporter creative style of a leader is positively related to the personal recognition subdimension of transformational leadership.***

### **5.2.2. Research Question 3b**

***How do creative style and leadership styles at the leader level relate to follower creative/innovative performance?***

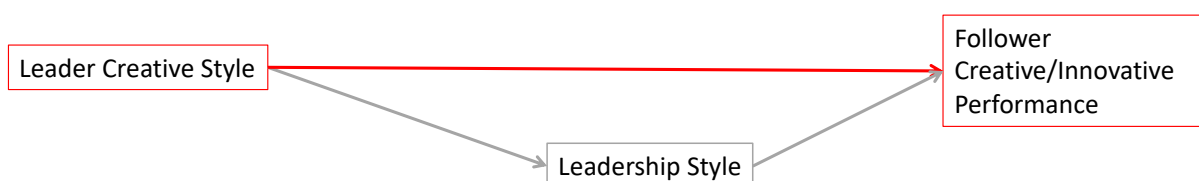
This section covers firstly, the relationship between a leader's creative style and creative/innovative performance of followers, building upon previous research from the main literature chapter and incorporating the findings from Study 1 presented in this thesis; secondly, the relationship between leadership style and creative/innovative performance, again where appropriate, adding to the literature previously discussed in this area; and finally, combining these previous two areas of research to explore the relationships between creative style, leadership style and creative/innovative performance - establishing what we already know from previous research, what we would expect to see from new research, and constructing testable hypotheses in line with the research and theory discussed.

#### **Creative style and creative/innovative performance**

The relationship between creative style and creative/innovative performance was discussed in detail both in the main literature review (section 2.2) and in Study 1 (section 4.1.1). In short, the position of previous published literature, driven by the dominant existing measure of creative style (the Kirton Adaption-Innovation Inventory), is that creative style and creative ability are entirely separate – that the extent of your preference for behaving in a certain way when pursuing creative outputs has no meaningful relationship to your level of success in achieving those outputs. The current research position is in agreement that everybody has a preferred creative style/s, and that this is relevant and generalisable to all levels of creativity; however, to claim that a measure of creative style is entirely distinct from the level of creative outcome begs the question of what exactly the measure of creative style does relate to, and what practical benefit is there of measuring and improving our understanding of the construct. This stance led to conducting Study 1 (chapter 4) to explore the relationship between creative styles and creative/innovative performance, whilst proposing that creative style(s) account for a significant amount of variance in creative/innovative performance, beyond that attributed to personality traits.

However, this research was conducted at the individual level only, the structure of Study 2 is multilevel, including leaders and followers who are matched. There is no discoverable existing research into the relationship between the creative style of a leader and the creative/innovative performance of their followers. For the multilevel elements of this research, an estimated required sample size, based on the work of Maas and Hox (2005), would be that the higher level sample (i.e. leaders) shouldn't be significantly below 100. Therefore, the current research looked to obtain >100 leaders as part of the overall sample which is consistent with an estimated sample size >200 (i.e. >100 dyads) being required (Du & Wang, 2016).

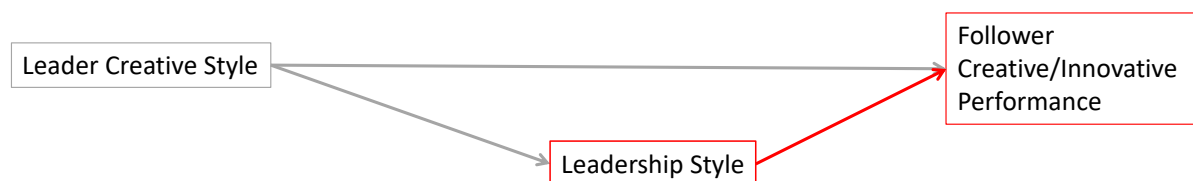
*Figure 5.3 – Theoretical framework with relevant relationships (leader creative style and follower creative/innovative performance) highlighted in red*



### Leadership style and follower creative/innovative performance

As previously discussed in greater detail in the main literature review chapter (section 2.4), when this thesis and the presented research reference leadership style, the particular style of interest is transformational leadership. Transformational leadership is defined as “Transformational leadership entails establishing oneself as a role model by gaining followers’ trust and confidence. Transformational leaders state future goals, develop plans to achieve those goals, and innovate, even when their organization is generally successful. By mentoring and empowering followers, such leaders help followers to develop their potential and thus to contribute more effectively to their organization.” (Eagly & Carli, 2003) Although this is a well-established leadership style, its measurement (notably the Multifactor Leadership Questionnaire; Bass & Avolio, 1997) has been heavily criticised, with Rafferty and Griffin (2004) providing an alternative ‘Transformational Leadership Scale’ in an attempt to address some of the identified criticisms of the MLQ, notably around the fact that the MLQ is often used as a composite measure of transformational leadership, whereas the Transformational Leadership Questionnaire advocates for the measurements of transformational leadership at the more precise level of the underlying subdimensions.

*Figure 5.4 – Theoretical framework with relevant relationships (leadership style and follower creative/innovative performance) highlighted in red*



In terms of the relationship between leadership style and performance – specifically, creative/innovative performance of followers – a meta-analysis of the literature concerning transformational leadership and follower creative performance (Koh et al., 2019) found that there is a positive direct relationship between transformational leadership and follower creative performance, however, this effect diminishes when taking into account mediators such as creative self-efficacy; intrinsic motivation, identification with leader, psychological empowerment, innovation climate – all of which could be considered to be mechanisms (in addition to role modelling) through which both creative styles and leadership styles impact the performance of followers. These findings are supported by further research (Afsar et al., 2014; Afsar & Masood, 2018; Gong et al., 2009). When assessing creative performance, these studies refer to idea generation – which, when considering the context for the current research, is considered just one stage of the creative/innovative process. The

research on ambidextrous leadership provides a little more depth in terms of the performance measures considered, with Zacher et al.'s (2016) research finding evidence for a leaders' opening behaviours predicting the exploration behaviours of their employees; and leaders' closing behaviours predicting the exploitation behaviours of their employees. Put into the language of the current research, this suggests that leaders which score higher on the opening behaviours (which are largely aligned to transformational leadership) have employees who score higher on the earlier, more divergent stages of the creativity/innovation process such as task presentation and idea generation. Conversely, leaders scoring high on the closing behaviours (which are largely aligned to transactional leadership) had employees who scored higher on the later, more convergent stages of the innovation process such as idea validation and outcome assessment.

In summary, the existing research implies that a higher level of transformational leadership is linked to increased performance at the beginning of the creative/innovative process – in tasks such as idea generation. When constructing hypotheses for this study, the relationships being investigated are across levels with relationship being explored between the creative style of the leader, and the creative/innovative performance of the follower(s). There is a great depth of research the relationships between leadership style and follower creative performance (covered in the next section), yet to date there is no discoverable research into the relationship between leader creative style and follower creative performance, therefore testable hypotheses in this area need to some extent be grounded in logic rather than building upon empirical evidence.

One theoretical angle to consider is the previously mentioned social learning theory (e.g. Bandura, 1977; section 5.1) and leader role modelling, whereby a respected figure is observed and emulated in terms of their behaviour. It could be argued that these provide a theoretical basis for the non-Supporter creative styles of a leader (i.e. Stimulator, Spotter, Sculptor and Selector) to be a predictor of the performance of followers. These have been seen to be relevant processes/mechanisms for promoting beneficial behaviours in creative/innovative contexts (Newman et al., 2018; Renko, 2018), specifically in relation to follower creative performance (Li et al., 2015) as well as other contexts such as ethical behaviour (Brown et al., 2005; Ogunfowora, 2014) and organisational citizenship behaviours (Yaffe & Kark, 2011). This has also been found in research across multiple time-points, that leaders can influence team creativity by acting as a role model i.e. an example of a respected and effective leader (Chen et al., 2021). This would lead us to the logical conclusion that, providing the leader is respected and effective, the leader's behaviour could be positively emulated in the follower. This implies that we could expect the same positive relationships observed in Study 1 between certain

creative styles and performance at particular stages of the creative/innovative process, specifically: that the Stimulator creative style positively predicts follower task presentation and idea generation performance; the Spotter creative style positively predicts follower idea generation performance and the Selector creative style positively predicts follower idea validation and outcome assessment performance. Mechanisms which are theorised to enable the creative style of a leader to impact upon the creative/innovative performance levels of the follower include ‘leader encouragement of creativity’ which is discussed in greater detail as part of the additional analyses following Study 2 (section 5.5.4), in short this follows established findings from previous empirical research which states that the encouraging behaviours of a leader in the pursuit of creativity impact upon the motivation and self-efficacy of the follower, which in turn impacts upon their creative/innovative performance (Cheng & Yang, 2019; Cheung & Wong, 2011). In terms of the current research, the creative style of a leader – particularly that of the Supporter creative style – is concerned with promoting and encouraging creativity in others, therefore tapping into this mechanism of enhancing follower ability, theoretically this could be explained through leader encouragement whereby the creative style of a leader (in this case the Supporter creative style) potentially increases the existing creative style preference of the follower through encouragement, which in turn impacts the level of related creative/innovative performance of the follower.

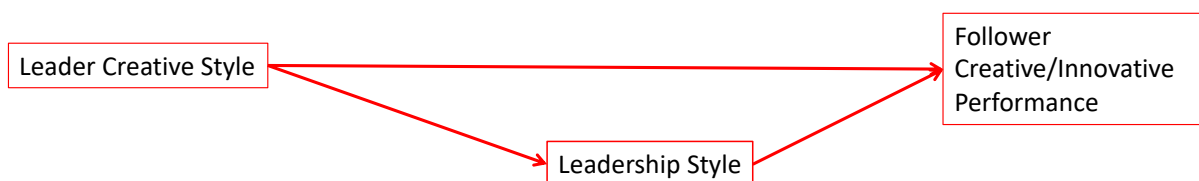
### **Leader’s creative style, leadership style and follower creative/innovative performance**

The previous sections have explored the literature on three areas:

1. The relationship between creative style and leadership style
2. The relationship between creative style and creative/innovative performance
3. The relationship between leadership style and creative/innovative performance.

This section will now bring this all together to explore Research Question 3b – What are the implications of a leader’s creative style and leadership style for their follower’s performance?

*Figure 5.5 – Theoretical framework with relevant relationships highlighted in red*





Firstly, it is proposed that creative style could be a predictor of leadership style – specifically that a higher level of Supporter creative style preference is linked to a higher level of transformational leadership style.

Secondly, it was demonstrated in Study 1 presented in this thesis that the Supporter creative style did not significantly predict performance at any stage of the creative/innovative process at the individual level. However, as has been discussed in previous sections of this thesis, the Supporter creative style is the only one of the five identified that does not have logical or theoretical links to individual performance. In contrast to the other styles, the Supporter creative style prefers to get the best from others and create an environment for success that others thrive in, whilst maintaining harmony and positive working relationships within groups. This brings about considerable overlap between the Supporter creative style and the transformational leadership style previously discussed. Therefore, it is suggested, in line with the literature on leadership styles predicting creative/innovative performance, that a higher Supporter creative style preference of a leader does predict higher creative/innovative performance of their followers. This leads to the logical assumption that the Supporter creative style predicts a transformational leadership style which in turn predicts increased follower performance. Additionally, as previously noted in this thesis, social learning theory and role modelling could provide a mechanism by which the creative style of a leader could have a direct relationship with the creative/innovative performance of their followers – whereby the behaviours preferred by leaders are observed and recreated by followers, leading to alignment in the creative style and creative performance relationships observed at an individual level.

This leads to the formation of the following testable hypotheses:

***Hypothesis 2a – The Stimulator creative style of a leader is positively related to the idea generation performance of followers.***

***Hypothesis 2b – The Spotter creative style of a leader is positively related to the idea generation performance of followers.***

***Hypothesis 2c – The Supporter creative style of a leader is positively related to the creative/innovative performance of followers at all stages (task presentation, preparation, idea generation, idea validation, outcome assessment).***

However, one important thing to address before considering the formation of testable research hypotheses, is the measurement of transformational leadership. The specific measures used in the current research are outlined in detail in the relevant section (5.3.3), but this needs to be addressed

first on a theoretical level. As has already been mentioned, the dominant measure of transformational leadership has to date been the Multifactor Leadership Questionnaire (MLQ; Bass & Avolio, 1997) and in line with the general usage of this tool, the associated research refers to 'transformational leadership' as a single construct, using a single composite measure. Although transformational leadership, as measured by the MLQ, is made up of four underlying facets (idealized influence, inspirational motivation, intellectual stimulation and individualized consideration), these are considered to contribute toward the broader construct of transformational leadership, with scores on each facet being summed or averaged in order to obtain an overall 'score' for transformational leadership. One of the main criticisms of the MLQ, as highlighted by Rafferty and Griffin (2004) in particular, is this factor structure – firstly, at a theoretical level of demonstrating that the underlying factors all contribute to a common construct; and secondly, at a measurement level where questions could be asked about individual measurement items and how they are deemed to map onto specific facets. The outcome of this criticism has been Rafferty and Griffin's Transformational Leadership Scale which makes slight tweaks to the names and definitions of the four facets identified by Bass & Avolio, as well as adding a fifth facet which actually features in the MLQ's measurement of transactional leadership. Specifically, in transitioning from the MLQ to the Transformational Leadership Scale:

- Idealized influence becomes vision.
- Inspirational motivation becomes inspirational communication.
- Intellectual stimulation is retained.
- Individualized consideration becomes supportive leadership.
- Contingent reward (a measure of transactional leadership) becomes personal recognition and is added to the subdimensions contributing to transformational leadership.

However, the main difference between the measurement methods is the fact that the Transformational Leadership Scale is designed to be used as separate subdimensions, which are acknowledged to contribute to transformational leadership, yet should not be averaged or brought together into a composite score that aims to accurately measure transformational leadership. This is a key reason behind the Transformational Leadership Scale being chosen as the measurement methods for the current research, in that (much like the Creative ID measure of creative style) the tool is designed to be explored in greater depth, with the acceptance of different styles and preferences better accounted for rather than having individual differences contributing to a broader, more vague measure of leadership style.

Taking this into account when considering the theoretical underpinning of research hypotheses – it is no longer as relevant to consider whether the creative style of a leader is related to their

‘transformational leadership style’, or whether this transformational leadership style as a whole relates to the creative/innovative performance of followers. Instead, it must be considered which of the underlying subdimensions of transformational leadership style relate to, or predict, other constructs of interest. Research findings involving transformational leadership broken down into its respective subdimensions are far fewer in number, and the majority of those found still use the MLQ as the preferred tool of measurement, yet select which of the underlying facets to use. Despite this change in measurement, the findings are relatively consistent with the broader literature on transformational leadership – with some studies finding that all of the underlying facets are positively and significantly related to follower creative performance (Teymournejad & Elghaei, 2017) and also organisational innovation (Khan et al., 2009) – though it must be noted that one of these papers involved a relatively niche participation sample of bank workers in Iran, and the other found that all relationships were moderated by organisation size. Despite these results, more robust findings in support of the transformational leadership subdimensions impacting the creative performance of followers comes from Nguyen et al. (2019) and Shafi et al. (2020) who found that all subdimensions predict increased employee creative performance through a mediatory relationship with intrinsic motivation; this finding and mediation was also noted by Boies et al (2015) in the case of intellectual stimulation and inspirational motivation predicting creative performance in employees. Further support for intellectual stimulation (Çekmecelioğlu & Özbağ, 2016; Thuan, 2019) inspirational motivation (Çekmecelioğlu & Özbağ, 2016; Hirst et al., 2009; Pons et al., 2016), idealised influence (Çekmecelioğlu & Özbağ, 2016), individualized consideration (Li et al., 2015) and contingent reward (Ghosh et al., 2023; Wang et al., 2011) have all been found to have positive predictive relationships with creative and/or innovative performance of followers. To sum up the literature on the subdimensions of transformational leadership and the creative/innovative performance of followers, Lee et al. (2020) succinctly note in their review of 13 leadership styles that all leadership styles (with the exception of transactional leadership) are associated with increased creative/innovative performance in followers.

This leads to the formation of the following testable hypotheses:

***Hypothesis 3a – Vision (also termed idealized influence) behaviour of the leader is positively related to follower creative/innovative performance at all stages.***

***Hypothesis 3b – Inspirational communication (also termed inspirational motivation) behaviour of the leader is positively related to follower creative/innovative performance at all stages.***

***Hypothesis 3c – Intellectual stimulation behaviour of the leader is positively related to follower creative/innovative performance at all stages.***

***Hypothesis 3d – Supportive leadership (also termed individualized consideration) behaviour of the leader is positively related to follower creative/innovative performance at all stages.***

***Hypothesis 3e – Personal recognition (also termed contingent reward) behaviour of the leader is positively related to follower creative/innovative performance at all stages.***

As with the research on transformational leadership as a whole, there is no discoverable research into the subdimensions of transformational leadership and creative style. However, Isaksen et al. (2003) did note that despite Kirton's claim that creative style is entirely distinct from levels of ability or performance, the KAI was found to be closely positively related to a measure of desirable leadership behaviours. Bearing in mind that the creative style of a leader is expected to relate to the creative/innovative performance of followers, that the leadership style of leaders is expected to relate to the creative/innovative performance of followers, and that creative style is expected to be related to leadership style – this brings about a network of relationships whereby a mediatory relationship is observed as illustrated in Figure 5.5. Referring back to Hypotheses 1a-1e which provide the expectations of which creative styles of leaders will positively relate to follower performance, we can incorporate the information from Table 5.1 which illustrates the where creative styles and the subdimensions of transformational leadership are expected to be related most strongly to make predictions regarding the potential relationships between the three constructs. To clarify, the expected relationships between leader creative style and follower performance are expected to be positively mediated (at least partially, with some of the variance in follower creative/innovative performance accounted for by leadership style after accounting for leader creative style) by the subdimension of transformational leadership most closely associated with the leader creative style.

This leads to the formation of the following testable hypotheses.

***Hypothesis 4a – Intellectual stimulation positively mediates the relationship between a leader's Stimulator creative style and idea generation performance of followers.***

***Hypothesis 4b - Intellectual stimulation positively mediates the relationship between a leader's Spotter creative style and idea generation performance of followers.***

***Hypothesis 4c – Inspirational communication positively mediates the relationship between a leader's Supporter creative style and creative/innovative performance of followers at all stages of the creative/innovative process.***

***Hypothesis 4d – Supportive leadership positively mediates the relationship between a leader’s Supporter creative style and creative/innovative performance of followers at all stages of the creative/innovative process.***

***Hypothesis 4e – Personal recognition positively mediates the relationship between a leader’s Supporter creative style and creative/innovative performance of followers at all stages of the creative/innovative process.***

### **5.3. Methodology**

#### **5.3.1. Study Methodology**

In addressing *Hypothesis 1a-1e* in relation to the correlation between creative style(s) and leadership style(s), as well as creative style(s) accounting for variance in leadership style(s) – the methodology of the chosen study was to obtain data on creative style and leadership style from participants currently in leadership positions, as well as control for relevant demographic variables (section 5.4.3). The design of the study was multi-source, obtaining data from both leaders and followers themselves to ensure that the study design was stronger than simply obtaining data relating to these two separate populations from a single source (e.g. follower self-perception, and follower-perception of leader). As covered in greater detail (section 5.3.2) the plan for collecting such data was to use the existing contacts and business relationships of Creative Creatures to obtain data in two ways – firstly, through gaining organisational access whereby an ‘introducer’ or ‘gatekeeper’ would provide access to an entire organisation for the research to be conducted within; and secondly, for existing contacts who are in leadership positions to directly respond to the survey, without the further obligation of opening up access to their organisation. This approach yielded some success, but a back-up plan was required which involved advertising the participation opportunity on LinkedIn. No payment was made to participants.

In addressing Hypotheses 2a-2c relating to the relationships between; leader creative style and follower creative performance, leadership style and follower creative performance, and leadership style mediating the relationship between leader creative style and follower creative performance – data were required from both leaders and their respective followers. The specific methods for collecting these data and matching the responses between leaders and followers is outlined in section 5.3.2.

### **5.3.2. Research sample and data collection**

Data were obtained from online surveys, with participants recruited in two ways; firstly, through directly contacting existing contacts of Creative Creatures and asking for their participation, and secondly, through advertising the on LinkedIn. Leaders, i.e. those with direct responsibility for managing/supervising/leaders others in their organisation, were targeted. It was made clear in the information sheet (a copy of which can be found in Appendix 5) that a requirement for participation was that the leader should participate themselves in the survey, before then passing on a personalised survey link for their followers to complete. This process was designed to be easy to complete, and anonymous – this was achieved by implementing the following steps.

1. The leadership focused questionnaire was provided to leaders who agreed to participate in the research. This involved them responding to measures regarding their creative style, leadership style, creative/innovative performance, job satisfaction and demographic variables. One item asked them to create a unique identifier code which consisted of the first three letters of their town/city of birth, two numbers corresponding to their birth date, and their shoe size. These particular categories of data were chosen due to the fact that they do not change over time, and do not give away any personal, sensitive or identifiable information. If a leader was born in London on the 15<sup>th</sup> of the month and has size 9 feet – their respective code would be LON159.
2. Upon completion of the survey, they are prompted to send a personalised link to their followers – the survey will automatically provide a link that consists of the standard follower web link, followed by the leader's unique identifier code.
3. The follower then receives the survey link from their leader – again, no personally identifiable information is asked of the follower, and confidentiality and anonymity is reinforced in the information sheet and survey messaging. The follower completes their survey involving responding to measures of their own creative style, creative/innovative performance, job satisfaction and demographic variables – as well as responses to measures in relation to their leader's leadership style. The survey system automatically inputs a 'hidden variable' which corresponds to the leader's unique identifier code – this ensures that both leader and follower have contributed surveys which contain a pairing variable. This allows the leader and follower responses to be matched, without ever asking for any names, contact details, or personally identifiable information from any participants.

As the participation required responses from both leaders and followers, the decision was made not to use data collection methods such as Prolific which involve participants more ‘distanced’ from the research team. By keeping the participation to those who were directly invited, or those who are connected to, or visible to, the research team on LinkedIn – it is hoped, although this narrows the scope of participation, that the responses provided are more likely to be from people that are genuinely in leadership positions, and are passing on the subsequent follower survey to genuine colleagues of theirs – although steps are taken to verify the identity of participants on online platforms (as detailed in Stanton et al., 2022), there is still an added level of anonymity compared to participants that can be personally reached.

This sample consists of 203 participants (78 leaders, 125 followers) who completed their respective survey. 60.1% of the respondents were female (37.4% male) with an age range of 20-67 years (mean 40.71). The most common countries of work being UK, Spain and Portugal (28.1%, 26.6% and 8.4% respectively). 37.4% of respondents had reached degree level education, and 48.8% a Masters degree. All respondents were in employment at the time of their participation, these employment positions range in industry, department and organisation – the majority (53.7%) had been employed in their current organisation for 4 years or fewer, and in their current role (65.5%) for 2 years or fewer. Finally, 58 of the respondents, accounting for 28.6% of the total sample (specifically, 22 leaders and 36 followers) were from a single PR/marketing organisation based in Spain and Portugal – ahead of the statistical analysis a dummy organisational variable was set up to appropriately control for any significant findings which could be directly attributed to this single organisation rather than the population in general.

### 5.3.3. Measures

The measures used in the surveys are outlined below and listed in full as part of Appendix 4 with Table 5.2 illustrating which participants provided responses to which measures for the purposes of Study 2.

*Table 5.2 – Survey measures completed by leaders and followers*

	Leaders	Followers
Creative style – Creative ID	X	X
Transformational Leadership Scale		X
Follower creative/innovative performance		X
Demographics	X	X

### *Creative Style*

The chosen measure of creative style for the research was the Creative ID tool, specifically the version as amended in Study 1. The original tool consists of 40 items, though a number of items were removed to improve the reliability of the measure. This measure was completed by both leaders and followers. The tool used in the current research consists of 19 items measured on a 6-point Likert scale ranging from 'completely disagree' to 'completely agree'. The tool measures five creative styles:

- Stimulator creative style – e.g. "Ideas are always popping into my head." (4 items,  $\alpha=.72$ )
- Spotter creative style – e.g. "I can easily combine seemingly unrelated pieces of information to generate a new idea." (4 items,  $\alpha=.78$ )
- Sculptor creative style – e.g. "It is easy for me to develop half formed ideas further." (3 items,  $\alpha=.63$ )
- Selector creative style – e.g. "I can list the pros and cons of an idea easily." (4 items,  $\alpha=.67$ )
- Supporter creative style – e.g. "I am good at getting a diverse set of people to join together around a common goal" (4 items,  $\alpha=.75$ )

The mean score of each scale is used as a measure of each respective style – i.e. in subsequent sections of this thesis, when referring to a Stimulator creative style preference, this refers to the mean score obtained across the 4 Stimulator creative style items. Ahead of performing the analyses, a further CFA was done on the Study 2 data to ensure that this measure was still fit for purpose – this produced satisfactory model fit indices (CFI = .901; RMSEA = .076; SRMR = .068).

### *Leadership Style – Transformational Leadership*

Leadership style in terms of transformational leadership is measured by The Transformational Leadership Scale (Rafferty & Griffin, 2004) which consists of 15 items, measuring 5 underlying facets of transformational leadership, namely: vision, inspirational communication, intellectual stimulation, supportive leadership, and personal recognition. This measure was only completed by followers.

In this 15-item scale, measured on a 5-point Likert scale ranging from 'strongly disagree' to 'strongly agree', participants are asked to "Bear in mind your leader" when responding:

- Vision – e.g. "Has a clear understanding of where we are going" (3 items,  $\alpha=.77$ )
- Inspirational communication – e.g. "Says things that make employees feel proud to be part of this organisation" (3 items,  $\alpha=.80$ )
- Intellectual stimulation – e.g. "Challenges me to think about old problems in new ways" (3 items,  $\alpha=.85$ )
- Supportive leadership – e.g. "Considers my personal feelings before acting" (3 items,  $\alpha=.89$ )



- Personal recognition – e.g. “Commends team members when they do a better than average job.” (3 items,  $\alpha=.87$ )

This scale obtained satisfactory model fit indices when subject to confirmatory factor analysis: (CFI = .966; RMSEA = .062; SRMR = .053).

The mean score of each scale is used as a measure of each respective leadership subdimension – i.e. in subsequent sections of this thesis, when referring to inspirational communication, this refers to the mean score obtained across the 3 inspirational communication items.

#### *Follower Creative/Innovative Performance*

The chosen measure of follower creative/innovative performance for the research is the adapted scale based on the work of Binnewies et al., De Jong and Den Hartog, and Scott and Bruce, as used in Study 1 (section 4.2.3). This measure was completed by followers only, as a measure of their self-perceived creative/innovative performance levels. The decision was made in Study 1 to remove 4 items from the measure (1 relating to Idea Generation and 3 relating to Preparation) resulting in a revised 13 item measure. When rechecking the reliability of the measure for Study 2, the decision was made to remove further items from the scale to improve reliability. This resulted in a 10 item scale measured on a 5-point Likert scale ranging from ‘strongly disagree’ to ‘strongly agree’:

- Task Presentation (3 items,  $\alpha=.65$ )
- Idea Generation (3 items,  $\alpha=.73$ )
- Outcome Assessment (4 items,  $\alpha=.69$ )

This measure achieves acceptable outcomes in terms of model fit indices (CFI = .924; RMSEA = .069; SRMR = .070). Again, mean scores are used across these scales in subsequent analyses.

This shortened scale, as outlined above, was found to be the most reliable format available when using these measures of performance – a single factor measure was also explored, both incorporating all 17 initial items [ $\alpha = .80$ , CFI = .509, RMSEA = .130, SRMR = .124], the 13 items used in Study 1 [ $\alpha = .76$ , CFI = .479, RMSEA = .158, SRMR = .142], and the 10 items identified above [ $\alpha = .70$ , CFI = .542, RMSEA = .161, SRMR = .135] – in each of these cases the alpha value indicating reliability would be considered acceptable ( $>.7$ ) but not the model fit statistics which were all less than .9 for CFI, and greater than .08 for both RMSEA and SRMR.

#### *Demographics*

Additional demographic information was collected in order to act as additional variables to control for in determining relationships between the main constructs of interest; creative style, leadership style, and creative/innovative performance. These include: sex (with dummy variables constructed for male

and female (coded 1=male, 0=female, and any other responses coded as missing data). The survey accommodated responses for 'Other' and 'Prefer not to say' in relation to sex – responses to these options were minimal (1 and 4 respectively) and therefore dummy variables were not made in relation to these. Data on age (years), tenure in organisation (years), and tenure in role (years) were also collected. These measures were collected from both leaders and followers. As previously mentioned, a dummy variable relating to organisation will also be created as 28.6% of the responses in the dataset come from a single organisation, this can be used as a control variable (coding 1=Target organisation, 0=Other).

Full measures used in the survey can be found in Appendix 4.

Following collection of the data, correlation analyses will be utilised to assess the relationships between creative style(s) of leaders, and their respective leadership style(s). Furthermore, regression analyses will be used to determine the extent to which an individual's creative style accounts for variance in their leadership style. Although the data in this study is from a single timepoint and would therefore be considered cross-sectional and unable to establish causal relationships, the purpose of these regression analyses is to give some insight into whether creative style may predict leadership style.

Following the collection of the data at both levels – data was organised to correspond with the convention of multilevel analysis whereby Level 1 variables are those directly corresponding to the data collected from followers, and Level 2 variables are those corresponding to the data collected from leaders which is aggregated appropriately in line with group membership. For example, all Level 1 participants that share a Level 2 leader will be matched with the appropriate data provided from their respective leader. As explained (section 5.3.2), this matching process is able to be achieved via a pairing variable which maintains the confidentiality and anonymity of participants. Multilevel analyses were then used to determine the relationships between the variables of interest – this method of analysis ensures that any effects identified have taken into account the group membership (i.e. the leader) of the individuals.

## **5.4. Results**

### **5.4.1. Statistical Approach**

The following chapter outlines the results in relation to Study 2.

Firstly, this addresses the relationships between creative style and leadership style – correlations between these constructs are established, before utilising regression analyses to determine whether creative style(s) accounts for variance in leadership style(s) in line with the hypothesised outcomes. Secondly, the relationships between creative style of a leader, leadership style and follower creative/innovative performance are addressed – again, correlations between these constructs are established, before using multilevel analysis methods to determine whether constructs at the leader level account for variance in performance at the follower level whilst taking into account group membership (i.e. matching followers to their respective leaders). For each analysis, it will be explicitly stated where demographic, or other meaningful variables have been controlled for.

In terms of the statistical software used and specific analyses conducted – the IBM SPSS Statistics program (Version: 29.0.0.0 (241)) was used for all correlations between research variables. Specifically, when these correlations are between two continuous variables, or in the case of data collected by Likert scale – treated as continuous, the analyses are referring to bivariate correlations, reporting the Pearson correlation coefficient with a two-tailed test of significance at the  $p < .05$  level. When these correlations are between a continuous variable and a dichotomous variable (such as sex, or another dummy variable created specifically for this research), the correlation refers to a point-biserial correlation, which again reports the Pearson correlation coefficient with a two-tailed test of significance at the  $p < .05$  level and can be interpreted in the same manner as other correlation outputs. SPSS was also used for linear regression, where unstandardised regression coefficients (B), the proportion of variance in the dependent variable explained by the independent variable(s) ( $R^2$ ) and significance figure (p) are all reported. Similarly, SPSS was used for multilevel analyses when it was inappropriate to use single-level linear regression due to the data coming from different levels (i.e. leader data and follower data) and therefore violating the assumption of independence as followers in the research will share a common leader. Conducting such multilevel analyses takes into account the impact of group membership in the output. In these cases, unstandardised regression coefficients (B) and significance values (p) are reported.

### 5.4.2. Descriptive statistics

Table 5.3 outlines the descriptive statistics in relation to the demographic variables measured as part of the research, later in this chapter correlations between demographic variables and research variables of interest are listed to determine applicable control variables for additional analyses.

*Table 5.3 – Descriptive statistics of demographic variables*

	Mean	SD	Min	Max	Total
Age (follower)	37.52	9.61	20	61	
Age (leader)	46.04	9.83	27	67	
Sex					
Follower – male					42 (34.7%)
Follower – female					79 (65.3%)
Leader – male					34 (44.2%)
Leader - female					43 (55.8%)
Tenure in organisation (follower)	5.28	5.85	0	32	
Tenure in organisation (leader)	8.17	7.60	1	32	
Tenure in role (follower)	2.50	2.84	0	17	
Tenure in role (leader)	4.32	4.31	1	17	
Organisation					
Target organisation					58 (28.6%)
Other organisations					145 (71.4%)

Table 5.4 illustrates the descriptive statistics in relation to the variables of interest in the research – specifically concerning the mean and standard deviation values, as well as skewness figures as it is acknowledged that the constructs being measured would generally be viewed positively by participants, and this could result in negatively skewed data which may require the application of transformation techniques in order to provide more interpretable results in subsequent analyses. Based on the descriptive statistics shown, it can be seen that a number of the measures of leadership style are negatively skewed with values more extreme than -1 which would be considered heavily skewed – based on this information, in subsequent analyses where the dependent variable may be considered significantly skewed, the original mean scores will be used as well as an additional analysis using a log transformation of the variable in an attempt to make the data more ‘normal’ for the purposes of interpreting the output.

*Table 5.4 – Descriptive statistics of independent and dependent variables*

	Mean	SD	Skewness Statistic
Leader Creative Style (self-rated, possible range 1-6)			
Stimulator	4.58	0.81	-0.04
Spotter	4.58	0.83	-0.16
Sculptor	4.53	0.84	-0.59
Selector	4.82	0.54	-0.32
Supporter	4.76	0.70	-0.78
Transformational Leadership Style (other-rated, possible range 1-5)			
Vision	4.24	0.68	-1.45
Inspirational Communication	4.25	0.66	-0.81
Intellectual Stimulation	3.95	0.72	-0.55
Supportive Leadership	4.18	0.79	-1.22
Personal Recognition	4.31	0.69	-1.33
Follower Creative/innovative Performance (self-rated, possible range 1-5)			
Task Presentation	3.97	0.50	-0.38
Idea Generation	3.48	0.61	0.03
Outcome Assessment	3.84	0.51	-0.10

### 5.4.3. Correlations

#### Leader's creative style and leadership style

Table 5.5 illustrates the correlations between leader's creative style aggregated across their followers, with perceived subdimensions of transformational leadership, as provided by the follower in reference to their leader. When considering the correlations significant at the  $p < .05$  level, this indicates that leaders with a high Spotter, Sculptor or Supporter creative style preference are perceived as demonstrating lower levels of personal recognition behaviours. Leaders with a higher preference for the Selector creative style are perceived as demonstrating higher levels of leadership vision. In terms of exploring Hypotheses 1a-1e, none of the observed relationships were hypothesised, and none of the hypothesised relationships were observed. In the case of Hypothesis 1e which stated that there would be a positive relationship between the Supporter creative style and personal recognition, the opposite was actually observed with a negative relationship found. The implications of these correlations are discussed in context following the more rigorous regression analyses to follow.

*Table 5.5 – Correlations between leader’s creative style (self-rated aggregated across followers) and the subdimensions of transformational leadership style (as rated by followers)*

	Vision	Inspirational Communication	Intellectual Stimulation	Supportive Leadership	Personal Recognition
Stimulator	.108	.165	.146	.032	.021
Spotter	.056	.073	.100	-.102	-.206*
Sculptor	.002	.042	.117	-.115	-.248**
Selector	.178*	.128	.105	-.043	-.031
Supporter	-.045	.039	.127	-.166	-.189*

*N=122; \* $p < .05$  \*\* $p < .01$  \*\*\* $p < .001$*

### **Leader’s creative style and follower creative/innovative performance**

Table 5.6 illustrates the correlations between leader’s creative style aggregated across their followers, with measures of follower creative/innovative performance, as provided by the follower. The only significant correlation indicates that leaders with a higher level of Supporter creative style preference have followers who perform to a higher level in idea generation activities. This significant relationship was hypothesised (Hypothesis 2c), however the Supporter creative style was expected to positively relate to all aspects of follower creative/innovative performance.

*Table 5.6 – Correlations between leader’s creative style (self-rated, aggregated across followers) and follower creative/innovative performance (self-rated)*

	Task Presentation	Idea Generation	Outcome Assessment
Stimulator	.036	.014	-.081
Spotter	-.064	.078	-.158
Sculptor	.050	.146	-.138
Selector	.055	.153	-.096
Supporter	.068	.199*	.025

*N=119; \* $p < .05$  \*\* $p < .01$  \*\*\* $p < .001$*

### **Leadership style and follower creative/innovative performance**

Table 5.7 illustrates the correlations between subdimensions of transformational leadership (as provided by the follower in reference to their leader) with measures of follower creative/innovative performance, also provided by the follower. The only significant correlation highlighted indicates that leaders who are perceived to demonstrate behaviours which intellectually stimulate their followers,

have followers who perform higher in task presentation activities. As above, the only significant relationship was hypothesised (Hypothesis 3c) yet based on previous research all elements of transformational leadership were expected to correlate with all stages of follower creative/innovative performance.

*Table 5.7 – Correlations between the subdimensions of transformational leadership style (provided by followers) and follower creative/innovative performance (provided by followers)*

	Task Presentation	Idea Generation	Outcome Assessment
Vision	.066	-.077	.049
Inspirational Communication	.135	.038	.005
Intellectual Stimulation	.225*	.171	.090
Supportive Leadership	.001	-.131	-.138
Personal Recognition	.066	-.102	-.094

*N=124; \* $p < .05$  \*\* $p < .01$  \*\*\* $p < .001$*

### **Demographic and control variables**

Table 5.8 illustrates the correlations between the research variables of interest, namely; leader creative styles (Stimulator, Spotter, Sculptor, Selector, Supporter), subdimensions of transformational leadership (vision, inspirational communication, intellectual stimulation, supportive leadership, personal recognition) and follower creative/innovative performance (task presentation, idea generation, outcome assessment) with demographic variables, namely; age, sex, tenure in organisation, tenure in role and organisation worked for. Coding for these variables can be found in section 5.3.3.

The correlations highlighted as significant indicate the following:

- In terms of age, both the age of the follower and age of the leader have significant positive correlations with leader creative styles – whereby older followers tend to have leaders higher in Sculptor and Supporter creative style preferences; older leaders tend to have higher Spotter and Selector creative style preferences themselves. Additionally younger followers seem to have leaders who are perceived to demonstrate higher levels of supportive leadership.
- In terms of sex, just one significant correlation was noted with male followers performing higher than females on idea generation activities.
- In terms of tenure in an organisation and tenure in a role – all significant correlations relate to leader creative styles. With leaders who spend more time in a role generally having higher

creative style preferences overall (with the exception of Spotter); in contrast, leaders with a greater time in their organisation having lower levels of Stimulator creative style preference. This implies that participants may have interpreted the item ‘How long have you been in your role’ in different ways – i.e. interpreted as ‘How long have you been a psychologist’ makes the responses non-dependent upon the questions ‘How long have you been in your organisation’. As such these correlations can be interpreted as leaders spending more time in the same profession having a higher preference for the Stimulator creative style, yet those staying in the same organisation for longer have lower preferences for the Stimulator creative style – therefore implying that leaders with a higher Stimulator creative style preference are those who stay in their chosen profession/job role for longer, yet move around organisations more frequently. This interpretation of the item wording is a methodological issue relating to survey design which will not be addressed in detail in this thesis. From a follower perspective, the results indicate that being in a role for longer correlates with having a leader who has higher Stimulator creative style preference; whilst being in an organisation for longer correlates with having a leader with higher preferences for Sculptor and Supporter creative style.

- Finally, in terms of organisation – this was measured using a dummy variable whereby a response of 1 corresponds with the participant working at a specific organisation which has contributed 28% of the survey data, 0 is used for any other organisation. The correlations imply that leaders who work at that particular organisation have lower Supporter creative style preferences, but are perceived as displaying higher levels of leadership vision and supportive leadership behaviours.

*Table 5.8 – Correlations between research variables of interest and demographic variables*

		Follower data				Leader data				Org
		Age	Sex	OrgTen	RoleTen	Age	Sex	OrgTen	RoleTen	
Leader creative style	Stim	-.033	-.114	-.103	.297***	.153	.120	-.049	.236*	-.045
	Spot	.161	.032	.053	.001	.230*	.074	.055	.293**	-.157
	Scul	.117	.127	.116	.047	.262*	.210	.039	.311**	-.312**
	Sele	.150	-.015	.031	.066	-.043	-.050	.025	.273*	.007
	Supp	.201*	-.006	.228*	.069	.188	-.015	-.011	.278*	-.261*
Trans. Leadership	Vis	-.103	.003	-.011	.046	-.252	.116	.046	.129	.219*
	IC	-.069	.001	.001	.007	-.109	.073	.006	.114	.100
	IS	-.152	-.065	.027	.109	-.059	.125	.048	.268	.138
	SL	-.212*	-.088	-.054	-.093	-.287	.036	-.183	-.217	.257**
	PR	-.148	-.119	.008	.045	-.304*	-.008	-.137	-.151	.147
Follow. Perf.	TaskP	-.072	.073	.098	.053	.137	-.162	.000	.038	-.030
	IdeaG	.070	.183*	-.036	.090	.163	.063	.250	.095	-.072
	OutAss	-.061	-.023	-.023	.027	.085	.099	.267	.072	.024

*N range=78-122; \*p<.05 \*\*p<.01 \*\*\*p<.001*



In further analyses presented, these factors will be considered as control variables when a significant correlation has been noted with the respective dependent variable.

#### **5.4.4. Regressions (single level and multilevel)**

##### **Intraclass correlations and data centering**

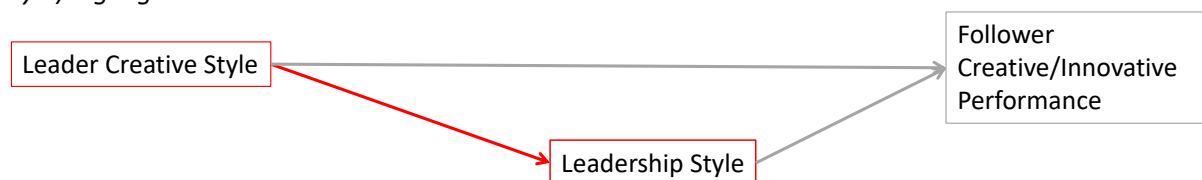
Given that the data collected involve input from multiple levels, whereby data collected at the leader level (in this case the creative style of the leader) are examined alongside data collected at the follower level (in this case, follower creative/innovative performance and follower-rated leadership style), it was expected that multilevel analyses would be required to account for any effects of group membership on the dependent variables. For example, to clarify whether simply working under a particular leader could have an impact upon follower performance, beyond the impact of the specific independent variables prescribed in the model. To determine whether these effects of group membership are meaningful, and therefore requiring a multilevel approach rather a single level approach to regression, intraclass correlations (ICC1) of all dependent variables were established. This statistic indicates the level of variance in these outcomes due to group membership alone with LeBreton & Senter (2008) noting that “a value of .01 might be considered a ‘small’ effect, a value of .10 might be considered a ‘medium’ effect, and a value of .25 might be considered a ‘large’ effect”. These statistics can be interpreted as percentages, whereby a figure of .01 would indicate that 1% of the variance in the variable can be attributed to group membership alone. For any variables obtaining a ‘small’ effect or lower (approximately  $\leq 1\%$  of the variance), multilevel analysis may not be applicable with single level being more appropriate due to the lack of group level effect.

In terms of the subdimensions of transformational leadership, ICC1 indicates that group membership alone accounted for 14.2% of the variance in vision, 12.6% in inspirational communication, 0.0% of intellectual stimulation, 18.5% of supportive leadership and 12.1% of personal recognition. This implies that when considering transformational leadership as a dependent variable, multilevel analyses are appropriate except in the case of intellectual stimulation which is deemed to have no variability at all accounted for by group membership alone. For follower creative/innovative performance the ICC1 figure indicates that 0.0%, 3.2% and 1.1% of the variance in task presentation, idea generation and outcome assessment respectively is explained by group membership alone.

In preparing for multilevel analysis, the decision was made to ‘grand mean centre’ the predictor variables. Generally, when centering data for multilevel analyses the decision to be made is whether to group mean centre which provides a value relative to other group members; or to grand mean centre which provides a value relative to the entire population. Considering the variables of interest in the current research – creative style and leadership style – the relatively small cluster groups (an average of 2.6 followers per leader), and also the absence of any insight into whether there are significant differences between groups, the decision has been made that the absolute level of the predictor variable is a more valuable measure than a value relative to other group members in predicting outcomes such as follower creative/innovative performance.

### Leader’s creative style and leadership style

*Figure 5.6 – Theoretical framework with relevant relationships (leader creative style and leadership style) highlighted in red*



Tables 5.9-5.10 display the multilevel analyses and single level regression analysis in relation to establishing the variance in the subdimensions of transformational leadership, accounted for by leader’s creative style. By considering this output in conjunction with the correlations between these variables outlined in section 5.4.3, a number of inferences can be made. The correlations showed that there was a positive significant correlation between the Selector creative style and vision; as well as significant negative correlations between both the Spotter and Supporter creative styles with personal recognition, and the Sculptor creative style with supportive leadership. However, when looking at the multilevel analyses (and single level regression in the case of intellectual stimulation), none of the creative styles, nor the demographic control variables are found to be significant predictors of the subdimensions of transformational leadership. The first thing to note is that in the case of intellectual stimulation, the results between the multilevel analysis and the single level regression analysis are identical – given that the ICC(1) for this variable was calculated to be 0% i.e. indicating that none of the observed variance in this variable could be attributed to group membership alone – this is exactly what would be expected. The outcome which came closest to being statistically significant is that of the Selector creative style accounting for variance in vision [ $B = .342$ ,  $t(1.816)$ ,  $p = .076$ ], one of the relationships which also had a significant positive correlation [ $r = .178$ ,  $n = 122$ ,  $p = .049$ ] though this correlation was only just significant at the  $p < .05$  level so it is no surprise to see that it is not a significant

predictor of transformational leadership subdimensions when included in a regression model alongside other creative styles and control variables which could account for some of the shared variance. Overall, this set of results is unexpected, and the results remain consistent even when applying a log transformation to the dependent variable data in an attempt to normalise the data from its natural negative skew. Furthermore, the results are consistent when using single-level regression analyses, implying that the significant relationships between these constructs are not there to be found regardless of whether you take into account group membership or not. For the sake of completeness and curiosity, further multilevel analyses were completed to determine whether the relationship actually works in the other direction – with transformational leadership predicting creative style. None of these analyses yielded significant results either.

In the literature review and development of hypotheses, parallels were drawn between the constructs of creative style and transformational leadership – definitionally, there was considered to be overlap between a number of the creative styles and the subdimensions of transformational leadership; and theoretically, the literature has called for research into constructs which may contribute to the prediction of desirable leadership styles – particularly in terms of exploring the creativeness or innovativeness of leaders (Koh et al., 2019). The current results are not able to support these predictions at present, though of course with a more substantial sample size a number of the results may become statistically significant. As further analyses in this thesis demonstrate, although there was not found to be a direct relationship between a leader's creative style and transformational leadership style – a number of further relationships and models involving the two constructs are still worth investigating to build a more detailed picture of how these constructs may contribute to the achievement of creative/innovative outcomes.

*Table 5.9 – Results of multilevel analysis accounting for variance in subdimensions of transformational leadership from leader’s creative style*

Predictors	Vision		Inspiration Commun.		Intellectual Stimulation		Supportive Leadership		Personal Recognition	
	Est	SE	Est	SE	Est	SE	Est	SE	Est	SE
Control variables:										
Organisation	.291	.185	.073	.190	.226	.182	.312	.222	-.033	.181
Age (follower)	-.002	.007	-.003	.007	-.010	.008	-.008	.008	-.007	.007
Leader’s creative style:										
Stimulator	.058	.108	.103	.112	.024	.102	.070	.132	.151	.104
Spotter	.033	.173	.052	.178	.006	.169	-.020	.208	-.096	.168
Sculptor	-.020	.153	-.032	.158	.094	.147	-.098	.186	-.194	.148
Selector	.306	.182	.141	.188	.042	.177	.079	.221	.193	.177
Supporter	-.181	.157	-.085	.161	.114	.154	-.184	.189	-.166	.153

*Est=unstandardised estimate; SE=standard error; N=122; \* $p<.05$  \*\* $p<.01$  \*\*\* $p<.001$*

*Table 5.10 – Regression: Leader creative style accounting for variance in intellectual stimulation transformational leadership behaviour*

	Model 1		Model 2	
	B	SE	B	SE
Control variables:				
Organisation	.171	.167	.226	.182
Age (follower)	-.009	.008	-.010	.008
Leader’s creative style:				
Stimulator			.024	.102
Spotter			.006	.169
Sculptor			.094	.147
Selector			.042	.177
Supporter			.114	.154
	F(2,116) = 1.992		F(7,111) = 1.279	
	R <sup>2</sup> = .033		R <sup>2</sup> = .075	
Model Change			F(5,111) = .994	
			$\Delta R^2$ = .041	

*N=122; \* $p<.05$  \*\* $p<.01$  \*\*\* $p<.001$*

Table 5.10 illustrates that the regression analysis produces identical results to the multilevel analysis in the case of predicting intellectual stimulation transformational leadership behaviour – this is expected due to the previously noted ICC value of 0% for this variable, indicating that there is no variance in the data attributable directly to group membership, and therefore a single level or multilevel analysis will yield the same outcomes. For the avoidance of repetition, these additional regression analyses will not be provided for the remainder of the thesis.

## Leader's creative style and follower performance

Figure 5.7 – Theoretical framework with relevant relationships (leader creative style and follower creative/innovative performance) highlighted in red

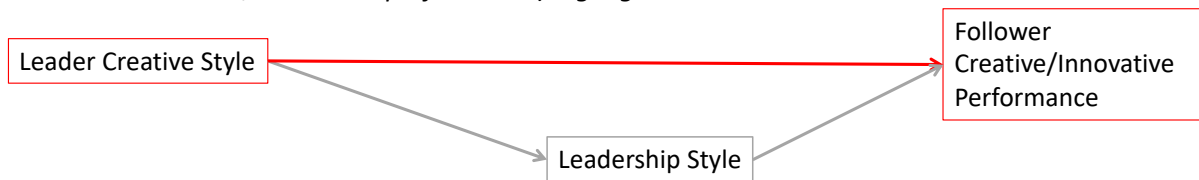


Table 5.11 displays the multilevel analyses in relation to establishing the variance in follower's creative/innovative performance, accounted for by leader's creative style. By considering this output in conjunction with the correlations between these variables outlined in section 5.4.3, it can be seen that the Supporter creative style of a leader both significantly positively correlates with follower idea generation performance [ $r = .199$ ,  $n = 119$ ,  $p = .030$ ] and also seen to be significant in accounting for variance in follower idea generation performance [ $B = .257$ ,  $t(1.977)$ ,  $p = .050$ ] in a prediction model including relevant control variables and other creative styles. Additionally, the Spotter creative style of a leader, despite not having a significant correlation with follower task presentation performance [ $r = -.064$ ,  $n = 119$ ,  $p = .492$ ], was found to be a significant variable in accounting for variance in follower outcome assessment performance [ $B = -.258$ ,  $t(-2.160)$ ,  $p = .033$ ] when considered alongside control variables and other creative styles – note that this is a significant negative relationship where higher levels of the Spotter creative style were seen to relate to lower levels of follower outcome assessment performance. Again, single level regression analyses were conducted for follower task presentation and outcome assessment performance due to their ICC(1) statistics being 0 – as expected in these cases, the single level and multilevel analyses yield identical results.

When interpreting these results, the implication is that when a leader has a higher level of Supporter creative style preference, their followers perform better at idea generation activities and outcome assessment activities. Though it is acknowledged that the statistical significance levels are just within the  $p < .50$  threshold and the correlation coefficients would not be considered 'high'. Additionally, these results imply that when a leader has higher levels of the Spotter creative style preference, their followers perform less well in task presentation performance which was not hypothesised. Implications for this relationship will be discussed in greater detail in the discussion chapter (section 5.6).

*Table 5.11 – Results of multilevel analysis accounting for variance in follower creative/innovative performance from leader’s creative style*

	Task Presentation		Idea Generation		Outcome Assessment	
Predictors	Est	SE	Est	SE	Est	SE
Control variables:						
Sex (follower)	.069	.102	.213	.120	.008	.099
Organisation tenure (leader)	-.002	.006	.015*	.007	.016**	.006
Leader’s creative style:						
Stimulator	.018	.076	.010	.089	.029	.074
Spotter	-.258*	.119	-.129	.140	-.049	.116
Sculptor	.126	.108	.020	.128	-.129	.106
Selector	.144	.125	.127	.147	-.124	.122
Supporter	.066	.110	.257*	.130	.204	.108

*N=122; \* $p < .05$  \*\* $p < .01$  \*\*\* $p < .001$*

### Leadership style and follower performance

*Figure 5.8 – Theoretical framework with relevant relationships highlighted in red*

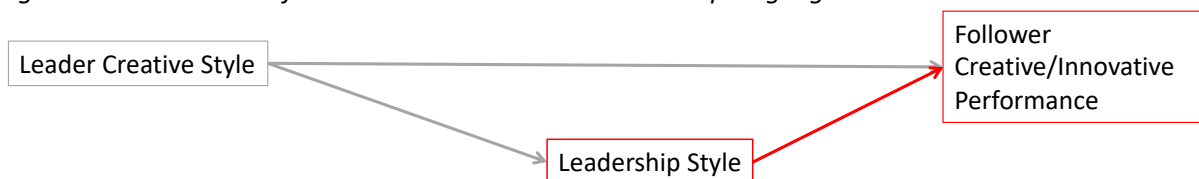


Table 5.12 displays the multilevel analyses in relation to establishing the variance in follower’s creative/innovative performance, accounted for by the subdimensions of transformational leadership. By considering this output in conjunction with the correlations between these variables outlined in section 5.4.3, it can be seen that there was a single significant result from the correlation analysis, indicating a significant positive relationship between intellectual stimulation and follower task presentation performance [ $r = .225$ ,  $n = 124$ ,  $p = .013$ ], yet this was not seen to be significant in the subsequent multilevel, or single level regression analyses relating to follower task presentation performance. In contrast, intellectual stimulation was not seen to have a statistically significant correlation with follower idea generation performance, though it was close to achieving a  $p$  value of  $<.05$  [ $r = .171$ ,  $n = 121$ ,  $p = .060$ ] and was found to be significant in the multilevel analysis in a predictor model alongside other subdimensions of transformational leadership and demographic control variables [ $B = .163$ ,  $t(2.258)$ ,  $p = .026$ ]. This indicates that when a leader is seen as displaying behaviour which evokes, or intends to evoke, intellectual stimulation in their followers, their followers perform better in idea generation activities. Theoretically, this makes logical sense as idea generation activities

generally require coming up with both novel ideas and a high quantity of ideas – in order for a leader to best enable this performance in their followers it would be beneficial to stimulate them intellectually, by encouraging them to think in new, different, or more diverse ways in the way they approach their tasks. The general non-significance of these findings is unexpected when considering the previous literature and hypothesised relationships – one possible reason for this could be the breadth of creative/innovative performance being measured in the current research. Whereas the majority of previous research focuses on creative performance in terms of idea generation alone which using a single composite measure of transformational leadership (Bono & Judge, 2003; Dong et al., 2017; Gong et al., 2009; Ma & Jiang, 2018; Rosing et al., 2011; Shin & Zhou, 2003), the current research includes additional stages of the creative/innovative process as identified in the Dynamic Componential Theory as well as breaking down transformational leadership into subdimensions. Therefore, future research may require more nuance in its predictions of transformational leadership's impact on follower creative/innovative performance to better account for these more specific measurement methods.

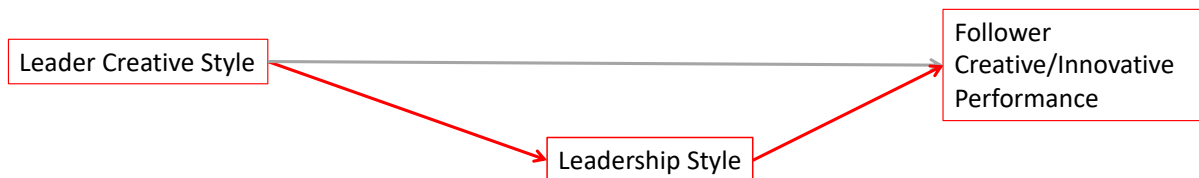
*Table 5.12 – Results of multilevel analysis accounting for variance in follower creative/innovative performance from the subdimensions of transformational leadership*

	Task Presentation		Idea Generation		Outcome Assessment	
Predictors	Est	SE	Est	SE	Est	SE
Control variables:						
Sex (follower)	.089	.099	.204	.116	-.054	.100
Organisation tenure (leader)	-.003	.006	.012	.007	.011	.006
Transformational leadership:						
Vision	-.025	.070	-.146	.081	.042	.070
Inspirational communication	.065	.082	.121	.096	.018	.083
Intellectual stimulation	.120	.062	.163*	.072	.052	.063
Supportive leadership	-.105	.072	-.129	.084	-.068	.072
Personal recognition	.027	.073	-.040	.084	-.052	.073

*N=122; \* $p < .05$  \*\* $p < .01$  \*\*\* $p < .001$*

## Mediation: Leader's Creative Style → Leadership style → Follower creative/innovative performance

Figure 5.9 – Theoretical framework with relevant relationships (leader creative style → leadership style → follower creative/innovative performance) highlighted in red



Hypotheses 2a-2c stated that the creative style of a leader would significantly relate to the creative/innovative performance of followers; additionally, Hypotheses 3a-3e stated that the subdimensions of transformational leadership style would also significantly relate to the creative/innovative performance of followers. This led to Hypotheses 4a-4e which stated that the positive relationships observed between leader creative style and follower creative/innovative performance would become non-significant due to the mediating effect of the subdimensions of transformational leadership. However, many of these hypotheses were not supported and this is discussed in detail in section 4.5.4 making the expected mediatory relationship impossible to find evidence for.

Despite this, for the sake of completeness and research interest, a further predictive model was created (outlined in Table 5.13) including both leader creative styles and subdimensions of transformational leadership as predictors in a multilevel model predicting follower creative/innovative performance.

Table 5.13 – Results of multilevel analysis accounting for variance in follower creative/innovative performance from leader creative style and subdimensions of transformational leadership

	Task Presentation		Idea Generation		Outcome Assessment	
Predictors	Est	SE	Est	SE	Est	SE
Control variables:						
Sex (follower)	.074	.103	.223	.119	-.032	.101
Org tenure (leader)	-.005	.006	.014	.007	.013	.006
Leader creative style:						
Simulator	.001	.062	.023	.073	.024	.061
Spotter	-.195*	.090	-.112	.107	-.054	.089
Sculptor	.095	.089	-.020	.105	-.119	.088



Selector	.076	.064	.103	.076	-.061	.063
Supporter	.009	.070	.102	.082	.096	.069
Transformational leadership:						
Vision	-.030	.072	-.166*	.083	.054	.071
Inspirational communication	.079	.085	.110	.099	.054	.083
Intellectual stimulation	.119	.063	.156*	.073	.051	.062
Supportive leadership	-.104	.073	-.106	.085	-.078	.072
Personal recognition	.006	.076	-.038	.089	-.100	.075

*N=122; \*p<.05 \*\*p<.01 \*\*\*p<.001*

In terms of interpreting the results as they are presented in Table 5.13, this analysis implies that when accounting for both the creative style of a leader, and transformational leadership behaviours (as well as controlling for relevant demographic variables) the significant predictors of follower creative/innovative performance are seen to be:

- The Spotter creative style of the leader negatively predicting task presentation performance of followers [ $B = -.195$ ,  $t(-2.156)$ ,  $p = .042$ ] implying that leaders who prefer to spot opportunities and patterns have followers who perform less well in terms of identifying, choosing and presenting initial creative opportunities.
- The intellectual stimulation subdimension of transformational leadership positively predicts both the task presentation performance of followers [ $B = .130$ ,  $t(2.054)$ ,  $p = .043$ ] and the idea generation performance of followers [ $B = .156$ ,  $t(2.118)$ ,  $p = .037$ ]. The latter relationship is consistent with the previous findings outlined in Table 5.12. Overall, this implied that leaders who encourage their followers to think about things in new and novel ways, have followers who do perform better in the generation of ideas, as well as identifying and communicating opportunities to be creative.
- The vision subdimension of transformational leadership was found to be a negative predictor of idea generation performance in followers [ $B = -.165$ ,  $t(-1.995)$ ,  $p = .049$ ] which implies that leaders who communicate and portray a positive image of the organisation and the future direction of the team, have followers who do not perform as well in coming up with new ideas.
- Finally, the previous significant relationship between the Supporter creative style of a leader and the idea generation performance of followers (Table 5.11) is no longer significant after including transformational leadership style subdimensions in the model.

#### 5.4.5. Addressing hypotheses

It was mentioned previously in this thesis (section 5.4.2) that some variables of interest in the research, namely the transformational leadership subdimensions of vision, supportive leadership and personal recognition, obtained negatively skewed data which implied that participants generally answered very positively to these scales. A log transformation was applied to the original mean scores to better 'normalise' them, with additional analyses run using these transformed values. Using log transformed scores instead of the raw mean scores did not impact the significance of any of the outcomes from the analyses in comparison to the mean scores; therefore, the decision was made to only present the mean scores obtained from participants responses in this chapter, without further transformations.

In addressing Hypotheses 1a-e, relating to the correlations between a leader's creative style and subdimensions of transformational leadership; as well as a leader's creative style predicting their transformational leadership style behaviours, it was found that:

- **Hypothesis 1a – The Stimulator creative style of a leader is positively related to the intellectual stimulation subdimension of transformational leadership.** This hypothesis was not supported; the Stimulator creative style of a leader was not found to significantly correlate with their intellectual stimulation behaviour [ $r = .146$ ,  $n = 122$ ,  $p = .108$ ], nor was it a significant predictor of intellectual stimulation behaviour [ $B = .035$ ,  $t(.348)$ ,  $p = .729$ ].
- **Hypothesis 1b – The Spotter creative style of a leader is positively related to the intellectual stimulation subdimension of transformational leadership.** This hypothesis was not supported; the Spotter creative style of a leader was not found to significantly correlate with their intellectual stimulation behaviour [ $r = .100$ ,  $n = 122$ ,  $p = .275$ ], nor was it a significant predictor of intellectual stimulation behaviour [ $B = .076$ ,  $t(.571)$ ,  $p = .569$ ].
- **Hypothesis 1c – The Supporter creative style of a leader is positively related to the inspirational communication subdimension of transformational leadership.** This hypothesis was not supported; the Supporter creative style of a leader was not found to significantly correlate with their inspirational communication behaviour [ $r = .039$ ,  $n = 122$ ,  $p = .669$ ], nor was it a significant predictor of inspirational communication behaviour [ $B = -.045$ ,  $t(-.286)$ ,  $p = .776$ ].
- **Hypothesis 1d – The Supporter creative style of a leader is positively related to the supportive leadership subdimension of transformational leadership.** This hypothesis was not supported; the Supporter creative style of a leader was not found to significantly correlate

with their supportive leadership behaviour [ $r = -.166$ ,  $n = 122$ ,  $p = .068$ ], nor was it a significant predictor of inspirational communication behaviour [ $B = -.132$ ,  $t(-.708)$ ,  $p = .482$ ].

- **Hypothesis 1e – The Supporter creative style of a leader is positively related to the personal recognition subdimension of transformational leadership.** This hypothesis was not supported; the Supporter creative style of a leader was found significantly correlate with their personal recognition behaviour, however, this was a negative relationship rather than the proposed positive relationship [ $r = -.189$ ,  $n = 122$ ,  $p = .037$ ]. Despite this significant correlation, the Supporter creative style was not found to be a significant (either positive or negative) predictor of personal recognition behaviour [ $B = -.176$ ,  $t(-1.133)$ ,  $p = .262$ ].

These results imply that, in predicting the subdimensions of transformational leadership style, none of the creative styles of a leader measured are significant predictors, which must lead to the conclusion (from the current research and participant sample at least) that a leader's creative style (as measured by the Creative ID) does not predict their leadership style (as measured by the subdimensions of transformational leadership).

Additionally, none of the hypotheses relating to correlation relationships were supported. However, as can be seen in Table 5.5 there were some significant correlations between a leader's creative style and their leadership style to note. Firstly, the Selector creative style was seen to positively correlate with vision [ $r = .178$ ,  $n = 122$ ,  $p = .049$ ] and just achieved significance at the  $p < .05$  level. This was not hypothesised but could be explained by the leader's creative preference for making decisions, seeing the big picture and therefore taking a more strategic, rather than short-sighted, view of the organisation and their role. This objective, forward-thinking preference could theoretically align to the transformational leadership subdimension of vision through the presentation of this clear, objective picture of the future to followers. Next, the Sculptor creative style of a leader, which was not hypothesised to have any significant relationships with any element of transformational leadership style, was found to significantly and negatively correlate with supportive leadership [ $r = -.210$ ,  $n = 122$ ,  $p = .020$ ] – in terms of explaining this relationship, this may imply that those leaders who prefer to build on the ideas of others do not do so in a supportive and constructive way when it comes to the people that they manage. Further research would be required to delve into this relationship further, but an explanation for this correlation may be that leaders with this preferred leadership style either take ideas from their followers to develop (and take the credit?); or are possibly over-critical of their followers' ideas and achievements, wanted them to be built upon and improved beyond a point at which the follower feels is necessary. Finally, both the Spotter and Supporter creative styles of the

leader significantly and negatively correlate with personal recognition [ $r = -.206$ ,  $n = 122$ ,  $p = .023$ ;  $r = -.189$ ,  $n = 122$ ,  $p = .037$ ]. In terms of the Supporter creative style, this is the opposite of the hypothesised relationship, which proposed that there would be a positive relationship due to the shared interest in the praise and recognition of others in reward for the achievement of goals. In explaining these negative correlations, it could be the case that for a leader with a high Spotter creative style preference that they are so focused on looking forwards and spotting new opportunities, that they do not take the time to recognise and reward what has already been achieved; alternatively, given their preference for making new links between things that others do not see, they may not recognise the achievements of others as outstanding – they may be difficult to please (and therefore withhold praise and recognition) due to judging others against their own hard-to-reach standard. In terms of the Supporter creative style, this negative relationship brings about an interesting theoretical point in that the personal recognition measure was initially part of transactional leadership in the MLQ (Bass and Avolio) though included in transformational leadership in the Rafferty and Griffin measure. Should this subdimension better fit with the more transactional, less personal approach of transactional leadership, this would explain why the Supporter creative style preference would negatively correlate with it. Alternatively, assuming that the personal recognition scale is correct to remain as a subdimension of transformational leadership style, this could be explained by the Supporter creative style preference having a consistently positive approach to leadership with regular feedback and performance discussions with their people to keep them motivated – therefore, either rendering the need for grander displays of personal recognition unnecessary, or that personal recognition is so commonplace that followers struggle to identify it as a substantial event to be remembered, it is simply the norm.

In addressing Hypotheses 2a-c relating to the correlations between a leader's creative style and follower creative/innovative performance; as well as a leader's creative style predicting follower creative/innovative performance, it was found that:

- ***Hypothesis 2a – The Stimulator creative style of a leader is positively related to the idea generation performance of followers.*** This hypothesis was not supported in terms of correlation or regression results.
- ***Hypothesis 2b – The Spotter creative style of a leader is positively related to the idea generation performance of followers.*** This hypothesis was not supported in terms of correlation or regression results.

- **Hypothesis 2c – The Supporter creative style of a leader is positively related to the creative/innovative performance of followers at all stages (task presentation, preparation, idea generation, idea validation, outcome assessment).** This hypothesis was partially supported – firstly it must be noted that due to the reliability of the measures used, only three of the five performance measures referred to in the hypothesis were utilised in the research. Of these three measures (task presentation, idea generation, outcome assessment), Supporter creative of a leader was found to positively and significantly correlate with idea generation performance of followers [ $r = .199$ ,  $n = 119$ ,  $p = .003$ ] as well as significantly and positively predict both idea generation and outcome assessment performance of followers in the regression models [ $B = .257$ ,  $t(1.979)$ ,  $p = .050$ ;  $B = .223$ ,  $t(2.097)$ ,  $p = .038$ ]. Therefore, this hypothesis is partially supported as the Supporter creative style of a leader was seen to positively correlate and predict some, but not all stages of follower creative/innovative performance.

These results imply that there are relationships to be found between the subdimensions of transformational leadership and follower creative/innovative performance – however, the extent of these findings is not in line with the general consensus in the literature which implies that all subdimensions of transformational leadership style are positively related to follower creative/innovative performance across the creative/innovative process. The theoretical and practical implications for these findings, as well as proposed reasoning for these results differing from other observations in the literature, are discussed in section 5.6.

- **Hypothesis 3a – Vision (also termed idealized influence) behaviour of the leader is positively related to follower creative/innovative performance at all stages.** This hypothesis was not supported in terms of correlation or regression results.
- **Hypothesis 3b – Inspirational communication (also termed inspirational motivation) behaviour of the leader is positively related to follower creative/innovative performance at all stages.** This hypothesis was not supported in terms of correlation or regression results.
- **Hypothesis 3c – Intellectual stimulation behaviour of the leader is positively related to follower creative/innovative performance at all stages.** This hypothesis is partially supported in that intellectual stimulation behaviour of a leader was found to be positively correlated with follower task presentation performance [ $r = .225$ ,  $n = 121$ ,  $p = .013$ ], and predict follower idea generation performance [ $B = .163$ ,  $t(2.258)$ ,  $p = .026$ ]. However, no further correlations

or predictive relationships were observed with other measures of follower creative/innovative performance.

- ***Hypothesis 3d – Supportive leadership (also termed individualized consideration) behaviour of the leader is positively related to follower creative/innovative performance at all stages.***

This hypothesis was not supported in terms of correlation or regression results.

- ***Hypothesis 3e – Personal recognition (also termed contingent reward) behaviour of the leader is positively related to follower creative/innovative performance at all stages.*** This hypothesis was not supported in terms of correlation or regression results.

These results imply that there are relationships of note observed between the subdimensions of transformational leadership style and the creative/innovative performance of followers, though not to the extent to which was hypothesised based on previous findings in the literature. However, this provides support for the work of Rafferty and Griffin (2004) and their Transformational Leadership Scale in that there has been value in measuring the subdimensions of transformational leadership separately, rather than using a composite single measure as is generally the case when researchers utilise the Multifactor Leadership Questionnaire (MLQ). Without going into the depth of the subdimensions, these more nuanced relationships would not have been identified. The theoretical and practical implications for these findings, as well as proposed reasoning for these results differing from other observations in the literature, are discussed in section 5.6.

- ***Hypothesis 4a – Intellectual stimulation positively mediates the relationship between a leader's Stimulator creative style and idea generation performance of followers.***
- ***Hypothesis 4b - Intellectual stimulation positively mediates the relationship between a leader's Spotter creative style and idea generation performance of followers.***
- ***Hypothesis 4c – Inspirational communication positively mediates the relationship between a leader's Supporter creative style and creative/innovative performance of followers at all stages of the creative/innovative process.***
- ***Hypothesis 4d – Supportive leadership positively mediates the relationship between a leader's Supporter creative style and creative/innovative performance of followers at all stages of the creative/innovative process.***
- ***Hypothesis 4e – Personal recognition positively mediates the relationship between a leader's Supporter creative style and creative/innovative performance of followers at all stages of the creative/innovative process.***

These hypotheses referencing mediation were not able to be supported due to the lack of support for the expected direct effects between the leader’s creative style and follower performance; and between the leader’s creative style and leadership style – meaning there was no significant initial relationships from which to identify a mediating relationship.

### 5.4.6. Summary

Figure 5.10 illustrated the hypothesised relationships between constructs for this research study. Figure 5.11 is an updated model to better represent the construct relationships in line with the research results. However, this simplified graphic does not tell the full story of the nuanced relationships between these constructs whereby relationships have only been observed for particular creative styles, specific leadership styles and with rating from particular sources (i.e. self-rated or follower-rated). A brief summary of the main findings in relation to the hypotheses is provided in Table 5.14 below, with the theoretical and practical implications discussed in greater detail in section 5.6.

Figure 5.10 – Study 2 hypothesised relationships

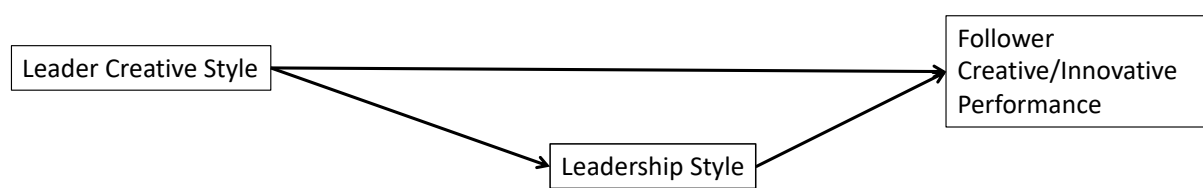


Figure 5.11 – Observed relationships

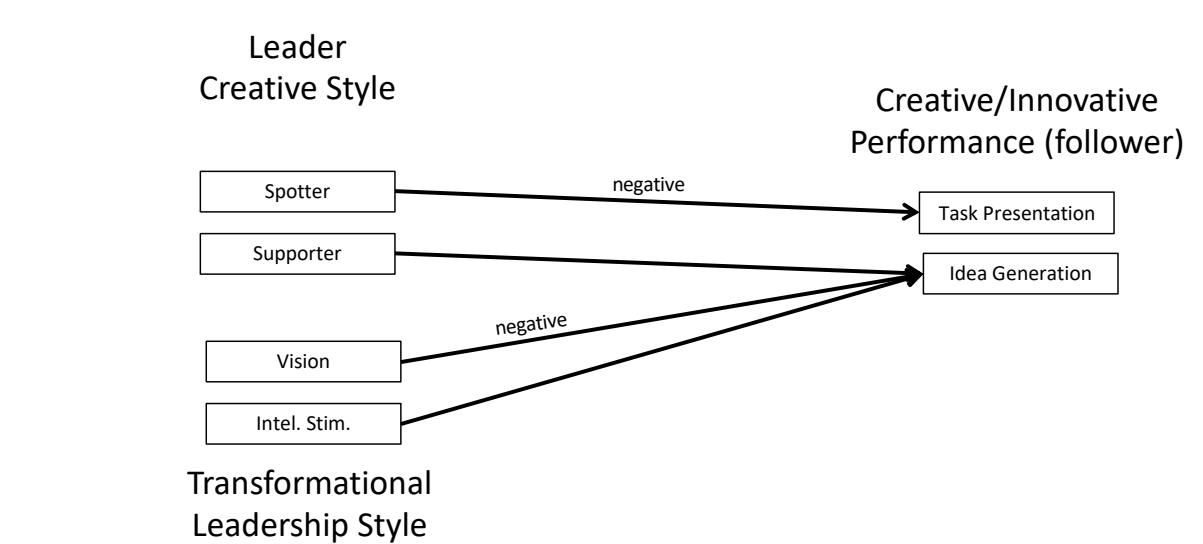


Table 5.14 – Summary of hypotheses and research outcomes

Research Question	Hypothesis	Outcome
3a – Does an individual's creative style predict their leadership style?	1a – The Stimulator creative style of a leader is positively related to the intellectual stimulation subdimension of transformational leadership.	Not supported
	1b – The Spotter creative style of a leader is positively related to the intellectual stimulation subdimension of transformational leadership.	Not supported
	1c – The Supporter creative style of a leader is positively related to the inspirational communication subdimension of transformational leadership.	Not supported
	1d – The Supporter creative style of a leader is positively related to the supportive leadership subdimension of transformational leadership.	Not supported
	1e – The Supporter creative style of a leader is positively related to the personal recognition subdimension of transformational leadership.	Not supported
3b – What are the implications of a leader's creative style and leadership style for their follower's performance?	2a – The Stimulator creative style of a leader is positively related to the idea generation performance of followers.	Not supported
	2b – The Spotter creative style of a leader is positively related to the idea generation performance of followers.	Not supported
	2c – The Supporter creative style of a leader is positively related to the creative/innovative performance of followers at all stages (task presentation, preparation, idea generation, idea validation, outcome assessment).	Partially supported
	3a – Vision (also termed idealized influence) behaviour of the leader is positively related to follower creative/innovative performance at all stages.	Not supported
	3b – Inspirational communication (also termed inspirational motivation) behaviour of the leader is positively related to follower creative/innovative performance at all stages.	Not supported
	3c – Intellectual stimulation behaviour of the leader is positively related to follower creative/innovative performance at all stages.	Partially supported
	3d – Supportive leadership (also termed individualized consideration) behaviour of the leader is positively related to follower creative/innovative performance at all stages.	Not supported
	3e – Personal recognition (also termed contingent reward) behaviour of the leader is positively related to follower creative/innovative performance at all stages.	Not supported
	4a – Intellectual stimulation positively mediates the relationship between a leader's Stimulator creative style and idea generation performance of followers.	N/A*
	4b – Intellectual stimulation positively mediates the relationship between a leader's Spotter creative style and idea generation performance of followers.	N/A*
	4c – Inspirational communication positively mediates the relationship between a leader's Supporter creative style and creative/innovative performance of followers.	N/A*



	4d – Supportive leadership positively mediates the relationship between a leader’s Supporter creative style and creative/innovative performance of followers.	N/A*
	4e – Personal recognition positively mediates the relationship between a leader’s Supporter creative style and creative/innovative performance of followers.	N/A*

*\*Mediatory relationships could not be found as the main direct relationships were not found to be significant*

## 5.5. Additional and Exploratory Analyses

### 5.5.1. Introduction

This section addresses the use of data collected for Study 2 (detailed in section 5.3.2) to conduct a number of additional analyses, that either; are in areas that became of interest due to the findings of Study 2, or are of a more exploratory nature that do not currently have the required depth of previous literature and theoretical grounding required for a formal construction of hypotheses. Firstly, these analyses attempt to replicate the findings of Study 1, specifically in terms of the relationships observed between creative style and creative/innovative performance at the individual level, with the aim of adding further support to those findings using an alternative dataset and participant population. Secondly, exploratory analyses assess the possibility of leader Supporter creative style as a potential moderator in the relationships between follower creative style and follower creative/innovative performance. Finally, exploratory analyses were utilised to explore a possible link between the creative style of followers and the leadership style of their respective leaders.

### 5.5.2. Recap of Study 1 findings

The methodology of Study 1 utilised two data collection timepoints whereby data on both creative style and creative/innovative performance were collected at both timepoints. The study aimed to explore the extent to which creative style (at time 1) can explain variance in creative/innovative performance (at time 2; six months later), after controlling for demographic variables and personality traits. The significant findings showed that:

- Stimulator creative style is positively related to both future task presentation and idea generation performance.
- Spotter creative style is positively related to future idea generation performance.
- Selector creative style is positively related to both future idea validation and outcome assessment performance.
- Supporter creative style is positively related to both future task presentation and idea validation performance.

As part of the data collection for Study 2, follower creative style was also measured using the Creative ID tool – the same measure as detailed previously (section 5.3.3) – which allows for another analysis of creative style and creative/innovative performance at the individual level. However, it is not possible to directly replicate the Study 1 analyses using Study 2 data, as responses relating to personality traits were not collected in Study 2 and therefore could not be controlled for. However, creative style and creative/innovative performance data were collected and therefore it can be expected that the same direct relationships would be observed, with the exception of the Selector and Supporter creative style predicting idea validation performance; Study 2 does not include a measure of idea validation performance as this particular scale was removed from the research due to inadequate levels of reliability based on the CFA conducted using Study 2 data (as discussed in section 5.3.3), though for clarity, this was included in Study 1 with acceptable model fit indices. Furthermore, in contrast to Study 1; Study 2 only collected data at a single timepoint, therefore appropriate inferences should be drawn from these cross-sectional results when comparing them to Study 1's results across two timepoints.

Specifically, this research aims to replicate the relationships which showed that:

***1a – Stimulator creative style is positively related to task presentation performance.***

***1b – Stimulator creative style is positively related to idea generation performance.***

***1c – Spotter creative style is positively related to idea generation performance.***

***1d – Selector creative style is positively related to outcome assessment performance.***

***1e – Supporter creative style is positively related to task presentation performance.***

### **5.5.3. Results**

#### **Correlations: creative style and creative/innovative performance**

Table 5.15 illustrates the correlations between an individual's creative style with creative/innovative performance. This shows that in Study 1, every creative style was positively and significantly correlated with every measure of creative/innovative performance – as previously noted, with a sample size of 438, most correlations will be deemed to be significant so the coefficients themselves will be more of the focus when discussing these results. In Study 2, these findings were largely replicated for both the correlations with task presentation performance and idea generation performance; with some notable differences in terms of outcome assessment performance. In particular, both the Stimulator and Sculptor creative styles were not found to significantly correlate with outcome assessment performance in this second research sample.

*Table 5.15 – Correlations between creative style and creative/innovative performance in Study 1 and Study 2*

	Task Presentation		Idea Generation		Outcome Assessment	
	Study 1	Study 2	Study 1	Study 2	Study 1	Study 2
Stimulator	.437***	.330***	.594***	.525***	.250***	.050
Spotter	.483***	.353***	.619***	.527***	.391***	.277**
Sculptor	.358***	.331***	.429***	.365***	.324***	.148
Selector	.435***	.361***	.452***	.422***	.461***	.450***
Supporter	.408***	.447***	.446***	.314***	.288***	.373***

*Study 1 N=438; Study 2 N=122; \* $p < .05$  \*\* $p < .01$  \*\*\* $p < .001$*

### **Regressions: creative style and creative/innovative performance**

Table 5.16 displays the regression analysis output in relation to establishing the variance in creative/innovative performance, accounted for by creative style of that individual. The table shows the results from the data collected in Study 1 and Study 2, side-by-side for comparison. In summary, this shows that, five significant relationships are observed in Study 1 and Study 2 respectively, of which three are replicated from Study 1 findings. Specifically, in terms of findings which have been replicated it can be seen that the Stimulator creative style was significantly positively related to idea generation performance [ $B = .228$ ,  $t(3.165)$ ,  $p = .002$ ] implying that those with a preference for coming up with ideas do actually reportedly perform better at idea generation tasks. The Selector creative style was found to positively relate to outcome assessment performance [ $B = .373$ ,  $t(3.814)$ ,  $p < .001$ ] implying that those making objective decisions, go on to perform well in tasks that involve assessing information and making objective judgements. Finally, the Supporter creative style was found to positively relate to task presentation performance [ $B = .197$ ,  $t(2.943)$ ,  $p = .004$ ] implying that people who support the success of others perform well in tasks that involve identifying opportunities and choosing which tasks to pursue. There were also significant relationships identified which were not consistent across the two studies. In Study 1 the Stimulator creative style was seen to positively relate to task presentation performance, but this finding was not replicated, while the Spotter creative style was positively related to idea generation performance. In Study 2, the Sculptor creative style positively related to task presentation performance, though this was not identified in Study 1 – the same can be said of the Supporter creative style positively relating to outcome assessment performance.

*Table 5.16 – Regression: Creative style accounting for variance in creative/innovative performance at the individual level for the participant populations of Study 1 and Study 2*

	Task Presentation		Idea Generation		Outcome Assessment	
	Study 1 B	Study 2 B	Study 1 B	Study 2 B	Study 1 B	Study 2 B
Stimulator	.165**	.079	.123*	.228**	.040	-.102
Spotter	-.034	-.052	.201**	.165	-.029	.117
Sculptor	.107	.200*	.111	.075	.030	-.173
Selector	.063	.033	-.044	.150	.237***	.373***
Supporter	.120*	.197**	-.028	-.033	.022	.146*
	$\Delta R^2 = .095$	$\Delta R = .304$	$\Delta R^2 = .068$	$\Delta R^2 = .341$	$\Delta R^2 = .074$	$\Delta R^2 = .278$
	$p < .001$	$p < .001$	$p < .001$	$p < .001$	$p < .001$	$p < .001$

*Note – figures are from the final regression model after controlling for relevant demographic variables and personality traits in Study 1, and relevant demographic variables in Study 2.*

*Study 1 N=303; Study 2 N=122; \* $p < .05$  \*\* $p < .01$  \*\*\* $p < .001$*

In terms of interpreting these results and their significance – although three significant positive relationships between creative style and creative/innovative performance have been observed across two independent participant samples, the significance of these findings should be tempered by the fact that an additional four relationships were observed in one study or the other, without being consistent across the samples. Furthermore, there are methodological issues with comparing results across these two studies regarding the discrepancies already detailed regarding how the data were collected (two timepoints in Study 1; one in Study 2), how personality traits were only controlled for in Study 1, and also how the Study 2 participants were all subordinates accountable to a leader, whereas a number of the Study 1 participants may have not had a leader as they were self-employed or at CEO level for example. Nonetheless, observing expected relationships occur across different studies with independent participant samples should not be ignored, and can be considered as a basis for which to conduct further research with an extra level of confidence that those observed relationships are generalisable to further populations.

#### **5.5.4. Exploratory: Impact of leader's creative style**

In addition to the replication of previous results which involve variables which are all at the individual level, this exploratory analysis looks to explore the potential moderation effect of a leader's creative style on the relationship between follower creative style and follower creative/innovative performance. As discussed in other areas of this thesis, the creative style most associated with leadership, most associated with empowering and improving the performance of others, and in fact,

the only creative style which is primarily focused with others (rather than the self) is the Supporter creative style. That makes this creative style of the leader the focus of this area of the research as a potential moderator. There is no discoverable research which specifically looks into creative style of a leader as a moderator of follower performance – however, the main literature review section of this thesis (section 2.4.3) highlights the research and findings into the importance of leadership and leadership style in the prediction of follower creative/innovative performance. In addition to this, there is research into the impact a leader, and in particular how certain leadership behaviours or approaches, can moderate a relationship between a predictor variable and follower creative/innovative performance. One example of this comes from Ogunfowora (2014) who found that when exploring the relationship between ethical leadership style and follower job satisfaction, the relationship was stronger and more positive when the leader scored high on effectiveness and seen as a role model.

Based on previous research, and the behavioural preferences of the Supporter creative style, it is explored whether each of the previous hypothesised relationships (Study 1 – hypotheses 2f-2j) between follower creative style and follower performance could be moderated by leader Supporter creative style. This moderation effect is proposed that when a leader's Supporter creative style is higher, the positive relationship between follower creative style and follower creative/innovative performance is stronger. Specifically it could be proposed that when a leader has a strong Supporter creative style, they would allow their followers greater autonomy, responsibility and time required for followers with a Selector creative style to make objective assessments and logical decisions in deciding which tasks to pursue:

***2a – The positive relationship between a follower's Selector creative style and follower's task presentation performance is moderated by the leader's Supporter creative style.***

When a leader has a strong Supporter creative style, they could allow their followers greater autonomy, freedom and support for risk taking required for followers with a Stimulator creative style to generate a large quantity of new ideas:

***2b – The positive relationship between a follower's Stimulator creative style and follower's idea generation performance is moderated by the leader's Supporter creative style.***

When a leader has a strong Supporter creative style, they could allow their followers greater autonomy, responsibility and time required for followers with a Selector creative style to make objective assessments and logical decisions in terms of evaluating the success and future requirements of a creative/innovative process:

***2c – The positive relationship between a follower’s Selector creative style and follower’s outcome assessment performance is moderated by the leader’s Supporter creative style.***

*Note that previous hypotheses involving preparation performance and idea validation performance were not included as these measures were not used in Study 2.*

**Multilevel Analysis: Moderation effect of leader creative style**

Tables 5.17-5.19 display the multilevel analysis output in relation to establishing the variance in perceived follower creative/innovative performance, accounted for by follower creative style and leader creative style. Multilevel analysis was used in this case rather than single-level regression analysis due to the fact that data relates to two different levels – leader and follower – of which one is nested within the other. Each table represents a separate analysis where the measure of creative/innovative performance is predicted by; demographic control variables (the rationale for which is outlined in section 5.4.2), follower creative style, leader Supporter creative style, as well as including interaction terms between the relevant follower creative style and leader creative style in line with the explored moderation relationships. These results show that none of the interaction terms were found to be significant implying that, based on these analyses, the Supporter creative style of a leader does not moderate any tested relationships between follower creative style and follower creative/innovative performance.

*Table 5.17 – Results of multilevel analysis accounting for variance in follower task presentation performance from follower creative style and leader creative style and interaction terms*

Predictors	Task Presentation	
	Est	SE
Control variables:		
Sex	.029	.088
Organisation tenure (leader)	-.007	.006
Follower creative style:		
Stimulator	.092	.054
Spotter	-.052	.065
Sculptor	.134*	.064
Selector	.026	.057
Supporter	.139*	.056
Leader creative style:		
Supporter	-.015	.050
Interaction:		
FollowerSelector x LeaderSupporter	.037	.049

*Est=unstandardised estimate; SE=standard error; N=115; \*p<.05 \*\*p<.01 \*\*\*p<.001*

*Table 5.18 – Results of multilevel analysis accounting for variance in follower idea generation performance from follower creative style and leader creative style and interaction terms*

Predictors	Idea Generation	
	Est	SE
Control variables:		
Sex	.141	.101
Organisation tenure (leader)	.008	.006
Follower creative style:		
Stimulator	.157*	.062
Spotter	.118	.075
Sculptor	.078	.071
Selector	.090	.066
Supporter	-.057	.065
Leader creative style:		
Supporter	.098	.055
Interaction:		
FollowerStimulator x LeaderSupporter	-.002	.057

*Est=unstandardised estimate; SE=standard error; N=115; \*p<.05 \*\*p<.01 \*\*\*p<.001*

*Table 5.19 – Results of multilevel analysis accounting for variance in follower outcome assessment performance from follower creative style and leader creative style and interaction terms*

Predictors	Outcome Assessment	
	Est	SE
Control variables:		
Sex	-.026	.085
Organisation tenure (leader)	.008	.005
Follower creative style:		
Stimulator	-.080	.052
Spotter	.096	.064
Sculptor	-.127*	.061
Selector	.214***	.055
Supporter	.112*	.055
Leader creative style:		
Supporter	-.036	.047
Interaction:		
FollowerSelector x LeaderSupporter	-.047	.048

*Est=unstandardised estimate; SE=standard error; N=115; \*<.05 \*\*p<.01 \*\*\*p<.001*

#### **5.5.5. Correlations: follower creative style and leadership style of leader**

Referring back to Koh et al. (2019) who noted that there is no discoverable research into the innovativeness of transformational leaders, something which the current research could look into in an exploratory way by considering how the transformational leadership style of a leader relates to the creative style preferences of followers. As proposed in Study 1, it is expected that the creative style of an individual is relatively stable over time, yet in certain instances can change, with such changes accounted for to some extent by the experience of certain work-life events or other contextual factors. Tables 5.20 and 5.21 explore how the leadership style of a leader could be considered a contextual factor and how it may relate to the creative style of followers. It is acknowledged that the current research design which incorporates a single data collection timepoint is not suitable to determine such causal relationships, hence these initial exploratory analysis are not accompanied by truly testable research hypotheses – simply exploratory analyses which may inform future research directions. The expected relationships based on logic would suggest that having a leader that demonstrates high levels of inspirational communication and intellectual stimulation may lead their followers to develop the more stereotypically ‘creative’ styles; those which would involve using the inspiration and stimulation they have received to generate new and varied ideas (Stimulator) and to spot new opportunities for creativity (Spotter). Similarly those followers who experience a lot of supportive



leadership from their leaders, may then go on to prefer to be supportive of others in their pursuit of creativity (Supporter creative style).

*Table 5.20 – Correlations between creative style of follower (self-rated) and transformational leadership style (follower-rated)*

	Vision	Inspirational Communication	Intellectual Stimulation	Supportive Leadership	Personal Recognition
Stimulator	.142	.264**	.224*	.087	.091
Spotter	.152	.309***	.303***	.085	.115
Sculptor	.123	.272**	.162	.045	.145
Selector	.077	.079	.075	-.055	-.042
Supporter	.183*	.194*	.281**	-.038	.129

*N=122; \*p<.05 \*\*p<.01 \*\*\*p<.001*

*Table 5.21 – Regression: Transformational leadership style (follower-rated) accounting for variance in follower creative style*

	Stimulator		Spotter		Sculptor		Selector		Supporter	
	B	SE	B	SE	B	SE	B	SE	B	SE
Vision	-.085	.151	-.128	.134	-.098	.136	.066	.111	.131	.139
Insp. Comm.	.448*	.190	.455**	.168	.477**	.171	.138	.140	.080	.175
Intel. Stim.	.132	.129	.218	.114	.021	.116	.038	.094	.304*	.118
Supp. Leader.	-.082	.135	-.134	.120	-.204	.122	-.107	.099	-.392**	.124
Personal Recog.	-.129	.159	-.091	.141	.054	.143	-.090	.117	.204	.146
	F(5,117) = 2.453*		F(5,117) = 4.104**		F(5,117) = 2.773*		F(5,117) = .839		F(5,117) = 4.234	
	R <sup>2</sup> = .095		R <sup>2</sup> = .149		R <sup>2</sup> = .105		R <sup>2</sup> = .034		R <sup>2</sup> = .152	

*N=122; \*p<.05 \*\*p<.01 \*\*\*p<.001*

The results of these exploratory analyses imply that, as expected, leaders who display higher levels of inspirational communication have a significant positive relationship with levels of follower Stimulator and Spotter creative style preference – this was also seen to be the case for the Sculptor creative style, another style which is considered to be divergent in that they comes up with new solutions by building upon the ideas of others and is related to the openness to experience personality trait. An unexpected relationship highlighted that levels of supportive leadership displayed a negative relationship with follower Supporter creative style preference. This could possibly be explained by the leader providing enough supportive leadership for their respective team, that their followers do not need to perform that role themselves as the team's needs and environment for success are already taken care of. Given the nature of these exploratory analyses, and the relatively low sample size, no firm inferences will be

drawn – however, these relationships do provide some interesting potential routes for future research.

## **5.6. Discussion**

This section will discuss four main areas regarding Study 2 as well as the subsequent additional and exploratory analyses where appropriate:

1. The theoretical implications of the study findings – specifically those implications that are especially relevant to this piece of research in particular. To avoid repetition, theoretical implications relating to the research of creative style more broadly will be touched upon here, but discussed in a more appropriate level of detail in the main thesis discussion chapter (section 6.1).
2. The practical implications of the study findings – again study specifics will be discussed, with broader implications for creative style as a construct discussed in greater detail in a later chapter (section 6.2).
3. The recognised limitations of the study, both in terms of scope and methodological design.
4. Future research suggestions which are specifically borne out of these study findings. Broader research suggestions in the area of creative style will be discussed in a later chapter (section 6.4).

### **5.6.1. Theoretical implications**

#### **Research Question 3a**

#### **Does an individual's creative style predict their leadership style? Hypotheses 1a-e**

The theoretical implications of Study 2 will be broken down by research question, and the respective hypotheses addressed. Firstly, in addressing whether an individual's creative style relates to their leadership style (*Hypotheses 1a-e*) it was found none of the five creative styles (Stimulator, Spotter, Sculptor, Selector, Supporter) were found to be significantly related of any of the subdimensions of transformational leadership (Vision, Inspirational Communication, Intellectual Stimulation, Supportive Leadership, Personal Recognition) in regression analyses. However, there were some correlations to note, those the consideration of these should be given the appropriate weighting in that correlations are less rigorous analyses in determining meaningful relationships between variables. These included the Selector creative style positively correlating with vision – although not originally hypothesised, this makes sense as the Selector creative style is concerned with seeing the

bigger picture and making strategic decisions in order to progress toward a larger long-term goal. Therefore, it is logical that somebody who has a strong preference for this may also demonstrate a clear and tangible vision for the future of the team/organisation as this 'big picture' is something they prefer to work toward. The Sculptor creative style negatively correlated with supportive leadership which is interesting as none of the creative styles were expected to have negative relationships with the subdimensions of transformational leadership. However, an explanation of this could be that the Sculptor preference to take ideas and build on them, striving for improvements and overcoming barriers to success does not present itself in a way that is consistent with supportive leadership – the leader may take the ideas of a follower and build on them themselves (possibly taking credit?), or constantly want to improve upon the work of their followers which may be perceived as patronising or at the very least an indication that the follower's work is not valued in its present form. This notion is supported by the finding that the Sculptor creative style also negatively correlates with personal recognition (also not at a statistically significant level) – should a leader with a strong preference for Sculpting take/amend the work of others, they may also not be recognising the personal contribution of their follower. Further significant relationships with the personal recognition subdimension of transformational leadership were found, with both the Spotter and Supporter creative styles negatively correlating with this facet. Again this was not expected, though could be explained in the case of the Spotter creative style as this preference is concerned with identifying patterns and opportunities that others may often miss – theoretically this could result in those with a strong Spotter preference judging others by their own high achieving standards which results in a negative relationship with personal recognition as the actions of others are less often considered worthy of praise. In terms of explaining the negative relationship between the Supporter creative style and personal recognition – this could be explained by the nature and development of the personal recognition scale. This facet was originally termed 'contingent reward' and included in the Multifactor Leadership Questionnaire (MLQ; Bass & Avolio, 1997) as a measure of transactional, rather than transformational leadership, where it was considered a measure of a leader rewarding and providing positive feedback to followers only after certain tangible achievements were completed. In this way it was not considered so much a 'positive' leadership behaviour, but more a reactionary behaviour that provided positive feedback when it was absolutely necessary to do so. With the development of the Transformational Leadership Scale (Rafferty & Griffin, 2004) this element was renamed 'personal recognition' and introduced as a subdimension of transformational leadership due to the importance of recognising others in leadership behaviour. The fact that this subdimension of transformational leadership negatively correlates (to differing levels of statistical significance) with all but one of the creative styles brings back the debate about whether this should remain a measure of

transformational leadership or be removed. An argument against removing this element of transformational leadership lies in the observed results of the supportive leadership subdimension, which is an established dimension of transformational leadership whether measured by the MLQ or Transformational Leadership Scale – correlations between supportive leadership and the creative styles are very similar to those relationships observed between personal recognition and creative styles. To be clear, these observations should not be overstated in their importance – the relationships identified through this research were from correlations only, with the more rigorous regression analyses not finding any statistically significant findings in terms of an individual's creative style predicting their leadership style.

Theoretically, what is the significance of these findings?

It was expected that creative styles would positively correlate with, and even significantly predict, elements of transformational leadership – however, this has not been observed in the current research. Although many explanations could be posited for the observed relationships (or lack of) and supposed underlying mechanisms, given that there were so many non-significant relationships as well as a number of negative relationships where positive ones were expected, this may point to a measurement issue rather than a theoretical one. One avenue to explore is the possible disparity between self-rated and other-rated measures – for example, the measures used in the current study use a self-rated (i.e. leader perspective) scale for creative style and an other-rated (i.e. follower perspective) scale for transformational leadership style. There is great debate in the existing leadership literature concerning self-other disparity of measurement – a common observation whereby leaders (on a number of different scales) will rate themselves in a way that is not consistent with the way that their followers rate them (de Vries, 2012) – although logically, an individual's creative style would be best explored from the perspective of the individual as it is all about personal preference; and an individual's leadership style would be best explored from the perspective of others as this concerns the way followers experience somebody's leadership. This is the way the current research methodology was designed, however, data were also collected relating to transformational leadership style from the leader's own point of view. This provides the opportunity for an additional analysis to determine whether there is a level of leader-follower disparity in this population in terms of how the subdimensions of transformational leadership are perceived. Table 5.21 illustrates these correlations – when looking at the highlighted values on the diagonal, it would be expected that these would be significantly and positively correlated as they are measures of the same behaviours, in relation to the same leader. However, it can be seen that just one of these correlations is statistically significant, with both the self-rated and other-rated perceptions of supportive leadership being

significantly positively correlated. Furthermore, Table 5.22 shows that the mean score of all measures of transformational leadership is higher when the leader is self-rating, compared to the ratings given by their followers – a series of t-tests shows that the differences in means on subdimensions of transformational leadership between self-rated and other-rated are significantly different in three of the five dimensions, namely; inspirational communication [ $t(77) = 2.288, p = .025$ ], supportive leadership [ $t(77) = 3.080, p = .003$ ], and personal recognition [ $t(77) = 7.175, p < .001$ ].

*Table 5.22 – Correlations between the subdimensions of transformational leadership from the perspective of the leader and the perspective of the follower*

	Vision (other)	Inspirational Comm (other)	Intellectual Stim (other)	Supportive Lead (other)	Personal Recog. (other)
Vision (self)	.140	.142	.141	-.099	-.035
Inspirational Comm (self)	.123	.153	.232*	.122	.031
Intellectual Stim (self)	.047	.081	.177	.047	-.001
Supportive Lead (self)	.143	.117	.156	.341***	.170
Personal Recog (self)	-.023	.040	.179*	.029	.044

$N=122$ ; \* $p < .05$  \*\* $p < .01$  \*\*\* $p < .001$

*Table 5.23 – descriptive statistics of the subdimensions of transformational leadership from the perspective of the leader and the perspective of the follower*

	Self-rated				Other-rated			
	Mean	Min	Max	SD	Mean	Min	Max	SD
Vision	4.32	2.33	5.00	.61	4.24	1.00	5.00	.68
Inspirational Communication	4.36	3.33	5.00	.44	4.25	2.00	5.00	.66
Intellectual Stimulation	3.96	1.33	5.00	.69	3.95	2.00	5.00	.72
Supportive Leadership	4.33	3.33	5.00	.44	4.18	1.00	5.00	.79
Personal Recognition	4.63	3.67	5.00	.40	4.31	1.00	5.00	.69

Self-rated  $N=78$ ; Other-rated  $N=122$

*Table 5.24 – Correlations between leader’s creative style (self-rated) and the subdimensions of transformational leadership style (self-rated)*

	Vision	Inspirational Communication	Intellectual Stimulation	Supportive Leadership	Personal Recognition
Stimulator	.131	.331**	.472***	.024	.203
Spotter	.383***	.515***	.593***	-.042	.283*
Sculptor	.486***	.433***	.644***	.047	.360**
Selector	.310**	.265*	.491***	.018	.248*
Supporter	.349**	.434***	.539***	.123	.401***

*N=78; \* $p < .05$  \*\* $p < .01$  \*\*\* $p < .001$*

*Table 5.25 – Correlations between leader’s creative style (self-rated) and the subdimensions of transformational leadership style (follower-rated)*

	Vision	Inspirational Communication	Intellectual Stimulation	Supportive Leadership	Personal Recognition
Stimulator	.108	.165	.146	.032	.021
Spotter	.056	.073	.100	-.102	-.206*
Sculptor	.031	-.017	.105	-.210*	-.166
Selector	.178*	.128	.105	-.043	-.031
Supporter	-.045	.039	.127	-.166	-.189*

*N=78; \* $p < .05$  \*\* $p < .01$  \*\*\* $p < .001$*

One conclusion to draw from this is that there is a possible disparity between how a leader rates their own leadership style, and how followers rate their leader’s style with low correlations found on four of the five subdimensions of transformational leadership and significant differences in the means found on three of the five subdimensions. This notion of self-other disparity is further supported by the correlations illustrated in Tables 5.24 and 5.25 which clearly show that when both measures come from the leader’s own perspective there are a number of relatively strong and statistically significant relationships – in contrast when there is one measure from the leader perspective and one from the follower perspective, almost all of these significant positive relationships disappear, with some significant negative relationships identified. Of course in this case, there is no way of claiming which source (self or other) is providing the ‘right’ or ‘accurate’ without bringing in additional objective methods of measurement; though common method bias would be more likely from data collected from a single source at a single timepoint. This neatly aligns to a point made in Fischer and Sitkin’s (2023) paper which questions the usefulness of leadership style measures, claiming that currently there may be a distinct difference between what leaders perceive of themselves, or indeed how they intend to act, and how their actual behaviour is perceived by others. This also brings about the

opportunity to develop an ‘other-focused’ measure of creative style to explore whether this self-other disparity is also present and relevant to the creative style construct.

### **Research Question 3b**

#### **What are the implications of a leader’s creative style and leadership style for their follower’s performance? Hypotheses 2a-4e**

This research question firstly set out to clarify the relationship between a leader’s creative style and follower’s creative/innovative performance; secondly to explore the subdimensions of transformational leadership and follower’s creative/innovative performance; and finally, to explore a possible mediation relationship, with subdimensions of transformational leadership mediating the relationship between a leader’s creative style and follower creative/innovative performance.

It was proposed that due to the differing focuses of the creative styles – with four styles (Stimulator, Spotter, Sculptor and Selector) being focused on individual behaviour and the individual pursuit of creativity; and the fifth style (Supporter) being focused on enabling and supporting others in their pursuit of creativity – that there would be different mechanisms by which the creative style of a leader would impact upon the creative/innovative performance of followers. This is discussed previously (in section 5.2.2), though in short refers to the individual focused creative styles influencing followers through a process of role modelling and the Social Learning Theory (Bandura, 1977); and the Supporter creative style impacting followers more directly through enhanced motivation and self-efficacy. The hypotheses (2a – 2c) exploring these relationships were, however, not fully supported. None of the four ‘individual-focused’ creative styles of leaders were found to be significant predictors of any measure of follower creative/innovative performance. This could indicate that these particular creative styles are simply not related to follower performance, and that having stronger or weaker preferences for these creative styles as a leader are not likely to enhance your follower’s performance, though not hinder it either. In contrast, the Supporter creative style of a leader did positively and significantly predict follower creative/innovative performance in idea generation implying that a higher preference for the Supporter creative style does predict higher performance in followers on the that measure. Theoretically speaking, this is new territory and a fresh contribution to knowledge as no discoverable research could be found where creative style was explored using multilevel data of leaders and followers. Additionally, given that the results indicate that the Supporter creative style in leaders does predict some elements of creative/innovative performance in followers, this provides

further support for the inclusion of creative style in the Dynamic Componential Theory (Amabile & Pratt, 2016) as this fits with the description of creativity relevant processes included in the model (both in terms of behavioural and thinking styles, and leader input) and through the established prediction of creative/innovative performance, fits the mechanics of the model as well.

Based on previous research it was expected that all subdimensions of transformational leadership would positively predict follower creative/innovative performance at all stages (Hypotheses 3a – 3e). However, this was not the case, with only one significant positive relationship identified – intellectual stimulation positively relating to follower idea generation performance, with vision actually having a negative relationship with idea generation. Bearing these results in mind – that just one leader creative style related to follower creative/innovative performance, and one subdimension of transformational leadership positively related to follower creative/innovative performance – it was not expected that any interesting relationships would occur from adding both leader creative style and transformational leadership into the regression model together to predict follower creative/innovative performance. Hypotheses 4a-4e were deemed not applicable as they predicted mediatory relationships involving variables where the required direct effects were not observed, however, for the sake of completeness the models were run anyway. Though further research into these potential relationships would be recommended in future research, the initial theoretical conclusions which would be inferred primarily relate to our greater understanding of both the creative style and leadership style constructs, as well as the relationship between them. As has been previously discussed, there has been a lack of discoverable research into any potential relationships between creative style and leadership style, as well as into creative style of a leader and creative/innovative performance of followers. This research implies that there are some significant relationships to be observed between both a leader's creative style and elements of transformational leadership in relation to follower creative/innovative performance.

The Spotter creative style preference of a leader had a negative relationship with task presentation performance of followers implying that leaders with a preference for spotting opportunities and patterns have followers who do not perform as well on identifying and presenting opportunities for creativity themselves – this could be explained if the leader is seen to complete that role to such an extent that the followers do not feel the need to do so themselves. The Supporter creative style of a leader was seen to positively relate to the idea generation performance of followers, however, this relationship became non-significant upon the introduction of transformational leadership subdimensions into the regression model – also not conclusive, this adds some support to the



suggestions made throughout this thesis that the Supporter creative style is related to leadership behaviours and in the case of this analysis, some of the variance in follower creative/innovative performance previously accounted for by the Supporter creative style of a leader, is then attributed to elements of transformational leadership style (notably intellectual stimulation).

### **5.6.2. Practical implications**

The practical implications of Study 2 will be considered in this section, in line with the theoretical implications mentioned above. When considering whether an individual's creative style predicts their leadership style, the results of the research did not support this. In terms of practical implications, this contributes to our understanding of the constructs in that, based on the findings observed, it is implied that a leader's creative style and leadership style are not significantly related – therefore, regardless of a leader's creative style, this is not a barrier to becoming a leader or being a transformational leader. And alternatively, a leader's leadership style would not be seen as a predictor of their own creative style and the associated tendencies to perform higher at certain stages of the creative/innovative process.

An additional analysis as part of the discussion of Study 2 (section 5.5) highlighted that there was a notable disparity between the way that a leader perceived their own leadership style, and the way the followers of the leader perceive that leader's leadership style in line with the observations of de Vries (2012). In terms of practical implications of this insight, this highlights the need for taking into account multiple viewpoints regarding leadership, and the promotion of individuals into leadership positions. This implies that simply considering what a leader believes their strengths and leadership behaviours are (i.e. as part of a job application, a job interview, an assessment process) may not provide the whole, or even an accurate, picture of how others will perceive their leadership behaviours – again this is in line with the views of Fischer & Sitkin (2023) regarding the measurement of leadership style.

When considering the implications of a leader's creative style and leadership style for follower's creative/innovative performance, the main finding in this area of the research was that the Supporter creative style of a leader does positively predict follower creative/innovative performance in terms of the idea generation. This implies that in practical application, if there is a structured creative/innovative process or project being followed in an organisation, once the idea generation stage is upcoming there may be some value in bringing in leaders with a strong Supporter creative style preference to obtain higher performance levels from followers in these areas. The same could

be said of leaders who display higher levels of intellectual stimulation – these leaders may be best utilised in the idea generation stage of the creative process to better enable performance in their followers in line with previous research (e.g. Çekmecelioğlu & Özbağ, 2016; Thuan, 2019).

This leads on to the results of the regression analyses which included both leader creative styles and subdimensions of transformational leadership as predictors of follower creative/innovative performance. From the findings outlined above, it would be expected that leaders with a strong Supporter creative style preference, and a high level of intellectual stimulation would be the ideal leader for the idea generation stage of creativity. However, the result of this analysis show that intellectual stimulation was still a significant positive predictor of follower idea generation performance, yet the Supporter creative style of a leader was no longer significant, and vision emerged as a significant negative predictor. The influence of vision could be explained in that a high level of vision implied that the leader has a very clear idea of what the future looks like and communicated this effectively to others – therefore, having such a clear and concrete view of the future may limit the motivation for followers to generate new ideas, as the future may seem so set in stone to followers that they do not see the benefit in coming up with new ways of doing things as they will never be implemented – in line with research relating lower motivation with lower creative performance (e.g. Amabile & Pratt, 2016; Boies et al., 2015; Nguyen et al., 2019; Shafi et al., 2020). Practically, this implies that the Supporter creative preference of a leader is less impactful than initially implied, and also the level of vision a leader demonstrates should also be considered when decided which leaders should be best utilised in the creative stage of idea generation.

### **5.6.3. Limitations**

An obvious limitation to Study 2 is the participant sample – the limitations of this fall into three areas; the sample size, the leader-follower make up, and the overall diversity of the sample. Firstly, in terms of sample size, a total sample of 203, consisting of 78 leaders and 125 followers is not necessarily a problem in itself when looking at a single level. However, there were instances in the dataset where some leaders were not matched with any followers – this is not an oversight in the research methodology per se, it is simply unfortunate that these specific leaders who participated in the research either did not pass on the survey to their respective followers, or the survey was passed on but the followers chose not to participate in the research. This resulted in 125 followers nested within 48 leaders which, as has been noted in the literature, when the Level 2 (the level of leadership in the current study) has fewer than 50 cases, this can lead to biases and inaccuracies in regression coefficients, variances and standard errors (Maas & Hox, 2005). Secondly, in terms of the leader-

follower make up, given that there were 125 followers nested within 48 leaders, this gives an average leader-follower ratio of 2.6 – with the follower per leader range of 1-6. This demonstrates that the majority of leaders had small group sizes, with many in the dataset having a single follower – of course it cannot be known in an anonymous study whether these group sizes were an accurate reflection of the number of people that each leader is responsible for, it could be the case that leaders had larger numbers of followers though not all decided to participate in the research. These lower group numbers may have had an impact on the intraclass correlation statistic discussed in the multilevel analysis section of the results chapter (section 5.4.4) – given that many leaders had small follower groups, or were in fact dyads for the purposes of the research, even if there were genuine differences in Level 1 (follower) outcomes as a result of group membership, these effects would have been difficult to pick up in the current research. Finally, in terms of the overall diversity of the sample, 28.6% of the dataset came from a single organisation – on one hand this could have provided an excellent opportunity for multilevel research with three levels: followers nested within leaders, nested within organisations. However, in reality, this was not possible for the current research as the number of Level 2 (leader) groups and Level 3 (organisation) groups would have been too similar. Also, given that 28.6% of the participants came from a single organisation, this ensured that the majority of participants in the research were from the UK, Portugal or Spain (63.1%), many with a marketing background, and well educated (82.% with a degree or higher) could be considered a limitation in terms of generalising the research findings to a wider, more diverse population. Suggestions for addressing these limitations are made in the future research suggestions section (section 5.6.4). From a theoretical angle, an increase in participant numbers would allow for more rigorous statistical analyses such as structural equation modelling (SEM) – this would be beneficial in the case of Study 2 as the proposed theoretical framework (illustrated in Figure 5.1) could then be tested using a single analysis (multilevel path model analysis) to explore whether the entire suggested framework fits the collected data as a whole, rather than exploring this through a number of regression models which each look at individual pathways.

Another limitation to note is the reliability of the measures used in the research – in particular the measure of follower creative/innovative performance. As stated in Study 1 (section 4.2.3) this measure was created for the current research as an amalgamation of other scales previously used by Binnewies et al. (2007), de Jong & Den Hartog (2010) and Scott & Bruce (1995). This was done in an attempt to create a performance measure which was closely aligned to the individual and small-group innovation stages of the Dynamic Componential Theory (Amabile & Pratt, 2016), thus ensuring consistency between underlying theory, construct development, and empirical measurement.

Although deemed reliable when used separately in their own respective research, when brought together into a multi scale measure of creative and innovative performance, the statistical fit of these scales to the data collected has been poor and therefore a number of items, or in some cases full scales, have been discarded in order to proceed with a measure which is as reliable as possible. Unfortunately, given the time and resources restraints of a PhD project, it was not possible to conduct a rigorous process of developing a new scale in this case, however, a suggested strategy for doing so is discussed in the future research suggestions section (section 5.6.4). As part of the presented research each scale was assessed for internal reliability using Cronbach's alpha statistics, as well as assessing the model fit indices produced through confirmatory factor analysis to determine whether the proposed factor structure of each measure fitted the data collected as expected. In each case, only measures and scales which have achieved suitable outcomes on the model fit indices were retained for statistical analysis as part of the research.

A further limitation in relation to measurement is the desirable nature of the item wording in most of the measures used – in terms of creative style, leadership style and follower performance, it could be argued that the wording of the items is likely to draw positive responses from participants as they are worded in such a way that the majority of participants would either; like to align themselves to the construct in question or, feel that they *should* align themselves to the construct in question. In fact, this is a common issue for self-report scales in research – i.e. social desirability bias or acquiescent responding (Kreichmann et al., 2019). As can be seen from the distribution of responses, the majority are negatively skewed (Table 4.12 and 5.4) with people regularly implying that they 'prefer to be creative in a certain way', 'prefer to lead in a positive way' or 'perform well at different stages of the creativity and innovation process'. This impact for this is twofold, firstly in terms of statistics and theory – there is little variance in the responses and therefore fewer conclusions can be drawn from the findings. Secondly, in terms of practical significance, the value of scales which do not elicit much variance from participants should be considered when weighing up the time and resource involved in administering them, against the insights obtained as a result of them. Again, suggestions to address this potential limitation are provided in the future research suggestions section (5.6.4). Finally, as highlighted in Study 1 and the previous discussion regarding the measurement of leadership styles in general, it should be acknowledged that there is great debate about how useful the currently available measures of leadership style really are (Fischer & Sitkin, 2023), and whether future research would be better in utilising more objective behaviour measures of 'good' leadership, rather than self-report measures of leadership intention.

#### **5.6.4. Future research suggestions**

The first future research suggestion to be drawn from Study 2 would be to address the acknowledged limitation regarding the measurement of follower performance. The purpose of the measure, which was also used in Study 1, is to establish levels of performance at different stages of the creative/innovative process. To ensure consistent alignment with our underlying theory – the Dynamic Componential Theory (Amabile & Pratt, 2016) – the decision was made that the most common measures of creative performance, such as idea generation tasks or remote association tasks, were not appropriate for this research as they do not address the full scope of creative/innovative output as described by the model which includes the stages of; task presentation, preparation, idea generation, idea validation and outcome assessment. Therefore, following a literature review to explore whether these specific stages had been explicitly measured before, the scales from; Binnewies et al. (2007) for task presentation and preparation, de Jong and Den Hartog (2010) for idea generation and idea validation; and Scott and Bruce (1995) for outcome assessment, were adopted as they were considered to be the closest fitting existing measures to what this research required. Regrettably, in both Study 1 and Study 2, these scales and the overall measure of performance that they were combined to create, were not found to be as statistically reliable as expected and ultimately did not fit the data as well as required. Therefore, in each study, items (or in some cases entire scales) were removed from the analysis to ensure that the measures used were as reliable as possible as a measure of creative/innovative performance. The omission of these scales undoubtedly weakened some of the theoretical contributions made by the research, as well as having implications for the practical relevance of the research findings as not all stages of the creative/innovative process had performance measures in the research.

To remedy this limitation of the current research, it is suggested that an alternative measure be used in future research. The literature review conducted as part of this thesis was unable to find an existing measure of creative/innovative performance that aligned to all of the stages of the creative/innovative process outlined in the Dynamic Componential Theory. In finding a reliable alternative measure, it should be noted that there are a number of measures of innovative work behaviour – one of which being the scale developed by de Jong and Den Hartog (2010) which was adapted in part for the current research. This was deemed to be the most appropriate measure of performance due to its alignment to the creativity/innovation process stages – however, this measure (and others) is a measure of behaviour and assesses what people do, yet not necessarily how well they do it. In the case of idea generation for example, this scale asks people to what extent they agree with

statements such as *“I generate novel and innovative solutions to problems”* which can be considered a measure of idea generation performance as it directly relates to coming up with new ideas; however, a stricter and possibly more informative measure of performance would be to incorporate an element of quality and/or quantity, to assess how useful and how numerous the generated ideas are. Further literature reviews could be conducted which focus on identifying and evaluating the existing scales which align to the creative/innovative process stages of the Dynamic Componential Theory, ensuring to clearly distinguish between measures of creative/innovative behaviour and creative/innovative performance. Should appropriate scales not be readily available, a bespoke measure of creative/innovative performance could be developed and validated for future research – which aligns to the five stages of individual and small-group innovation as outlined in the Dynamic Componential Theory. The suggested process for doing so would be to firstly establish clear definitions for creative/innovative performance, and for each facet beneath this relating to task presentation, preparation, idea generation, idea validation and outcome assessment. Next, questionnaire items should be generated for each facet, ensuring that the items align to the relevant stages of the creative/innovative process and relate to performance (referencing quantity, frequency or quality) rather than preference or tendency. These items could be reviewed by a range of relevant experts in this area such as; academics, psychometricians, industry creativity and innovation experts, and a selection of people who are employed in a variety of roles and sectors to establish face validity of the items and initial scales. This last group would be example users of the measure who would ensure that items were both understandable and relevant for the target population. Once an initial measure was drawn up from these items, this should be tested on a sample population before undergoing exploratory factor analysis to determine whether the items fit a five-factor model as hypothesised. At this stage items can be reviewed, removed and/or amended as appropriate should they not fit a five-factor model, or should individual items not align with others that they would be expected to. This iterative process should continue until an acceptable five-factor structure is achieved, with appropriate levels of internal reliability for each of the five scales that make up the measure. Finally, confirmatory factor analyses should be used on a new dataset to ensure that the five-factor model holds true on an independent sample, that the respective fit indices reach appropriate levels to indicate that the data fits the proposed model, and to establish a suitable level of discriminant validity between the five scales (to ensure that they are indeed distinct factors). It is acknowledged that this is a resource and time intensive process, which is exactly the reason why this was unachievable as part of the current research; yet should this be completed to a rigorous level in the future, should result in a powerful tool that can be used to reliably measure self-report levels of creative/innovative performance across the entire creativity/innovation process. Furthermore, a performance measure

could be objective based upon performance on creative/innovative tasks administered by a simulation or lab study – alternatively these could be ‘real-life’ measures of creativity/innovation which are seen to be relevant to the participant sample. For example, these could include numerical measures of; ideas generated, ideas implemented, patents granted, time saved due to innovation, increased income or reduced expenditure as a result of innovation etc. Of course, the more specific the performance measure to a particular participant group or organisational sector, the less generalisable the research findings may be to a broader population.

The second research suggestion would be replicate the methodology of Study 2 – that being an online survey of matched leaders and followers to explore the relationships between a leader’s creative style, leadership style and follower creative/innovative performance – yet with some amendments to the measures used, and the participant sample. In terms of measures, it would be advised to create an alternative measure of creative style which is not self-report, but from the perspective of others – it is anticipated that this would not require a lengthy process of scale development, but rather a simple change of wording to reflect the ‘target’ of the scale is a colleague/peer/leader rather than the self. This could then be used in conjunction with the existing ‘self-report’ measure to give a more rounded view of how an individual both prefers to engage in creative activity, but also how their engagement in creative activity is perceived. Similarly, using a ‘self-report’ version of the Transformational Leadership Scale alongside the established ‘other-report’ version would give a multifaceted view of how a leader believes they lead and interact with others, as well as the perception of these behaviours from others. Finally, an ‘other-report’ measure of performance could be implemented to ensure that the performance levels of the follower (the main dependent variable in the study) are considered not just from a self-report perspective. The development of a reliable measure of creative/innovative performance should be undertaken in line with recommendations made previously (section 4.5). The purpose of this is to explore the level of self-other disparity in the perceptions of leader creative style, leadership style and follower creative/innovative performance – identifying this would both add to our theoretical understanding of the constructs, but also provide valuable practical significance for how the measures and outcomes can be interpreted in an organisational environment. In terms of the participant sample, Study 2 highlighted a negative correlation between the Supporter creative style and the supportive leadership subdimension of transformational leadership – this may be due to self-other disparity (which could then be addressed through the use of multi-perspective measures); or could be due to the fact that the Supporter creative style is considered with all creative activity in addition to leadership, whilst the supportive leadership dimension is concerned with all leadership activity in addition to creativity. To better understand this, a participant sample could be obtained

which specifically targets leaders in stereotypically creative industries, thus forcing the overlap between leadership and creativity to be tighter than it would be in a more generalised population sample. It is anticipated that this study design will provide more of a theoretical contribution firstly in terms of whether there is self-other disparity in the perception of creative style; and secondly to explore potential boundary conditions (i.e. leaders in a creative industry) of relationships between creative style and subdimensions of leadership style. Additionally, this study design (involving a larger number of both leaders and followers) would lend itself to looking at group dynamics within teams, as well as leader-follower relationships to determine whether specific combinations of creative style preferences within a team relate to higher performance outcomes.

Additionally, it should be recognised that in terms of measuring leadership style, the Transformational Leadership Scale (Rafferty & Griffin, 2004) used in the current research is one of a number of widely used scales for the measurement of transformational leadership. It should also be noted that transformational leadership is just one of a many defined and heavily researched leadership styles in the literature – transformational leadership was chosen for the current research as it has historically been the most used measure when considering the creative/innovative performance of followers – however, as touched upon in the literature review (section 2.4.2) the leadership style research trends have been moving towards ambidextrous leadership which could be considered as an alternative measure of leadership style for future creative style research. One final point on the measurement of leadership style is to touch upon the recent work of Fischer and Sitkin (2023) whose comprehensive review paper (published after the research presented in this thesis had occurred) on leadership style measurement posits that there are fundamental issues both with the definitions of leadership styles and their measurements. This thesis proposes that further research into the relationships between creative style, leadership style and follower creative/innovative performance are valuable, yet a thorough review of the latest leadership literature around both relevant styles and valid measurement methods would be required before embarking on future research in this area.

In terms of theoretical implications, a number of relationships between an individual's creative style and their creative/innovative performance have been replicated across different, entirely independent, research populations adding weight to those findings and our understanding of creative style. It should be acknowledged that in Study 1, these relationships were observed as a result of a more robust methodology whereby creative/innovative performance at Time 2 was predicted by creative style at Time 1, after controlling for personality traits – using the data collected from Study 2, this small additional study only utilises data at a single timepoint, and without controlling for



personality traits. However, these methodological differences aside, the purpose of this additional analysis was to replicate the main findings from Study 1 and add greater weight to our understanding of a construct which, to date, has been largely under-researched. Some relationships observed in Study 1 were replicated, adding further weight to the conclusion that the creative style of an individual does relate in some specific instances to their creative/innovative performance – specifically in terms of the Stimulator creative style being positively related to idea generation performance; Selector creative style positively related to outcome assessment performance; and Supporter creative style positively related to task presentation performance. In terms of theoretical contribution in this area, when considering the established models of creativity and innovation such as the Dynamic Componential Theory (Amabile & Pratt, 2016), the purpose of the model is to predict creative/innovative performance and detail the predictors and mechanisms which contribute to these outcomes. As has been discussed throughout this thesis, the Dynamic Componential Theory includes ‘creativity relevant processes’ as a contributor to creative/innovative performance – this is a very broadly described category without specific constructs or measures referred to. The current findings demonstrate that specific creative styles have been found to predict creative/innovative performance – more accurately, not just predicting idea generation (the often used, yet quite narrow, measure of creative performance) but predicting creative/innovative performance across a number of stages of the creative/innovative process, stages which are defined by the Dynamic Componential Theory. These findings therefore provide a starting point for considering the inclusion of creative style as a clearly defined construct to fit within the ‘creativity relevant processes’ area of the Dynamic Componential Theory. However, it is acknowledged that before creative style can be claimed to ‘fit’ within the Dynamic Componential Theory, much more rigorous research into the construct of creative style is required, specifically to take into account the other areas of the Dynamic Componential Theory such as motivation and domain specific knowledge/skills to determine how distinct creative style is from these constructs, and what creative style contributes to creative/innovative behaviour beyond that which can be accounted for by those constructs.

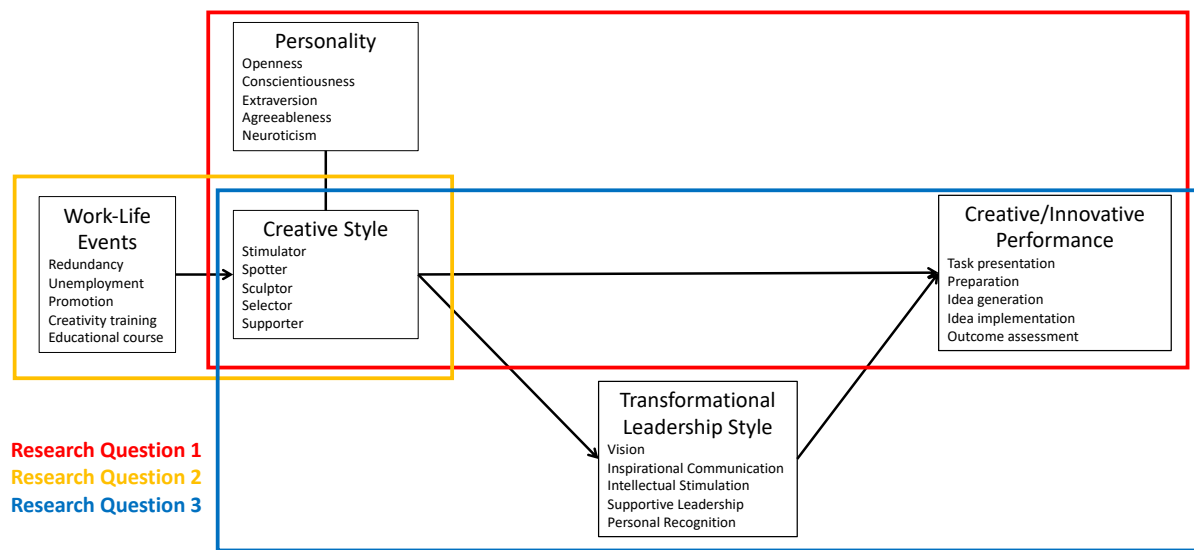
In terms of suggesting future research as a result of these findings, two recommendations can be made. Firstly, it would be recommended that research is conducted to further replicate the findings already discussed – specifically, one strong criticism of measures of creative style is that they may not have any predictive value beyond personality traits, therefore it is important to control for personality traits in future research, as well as utilising the most reliable measure of creative/innovative performance which is aligned to, and reliably measures all stages of the creative/innovative process

as identified in the Dynamic Componential Theory (more about the measurement of creative/innovative performance is covered in section 4.5.4).

The second suggestion for future research again focuses on reducing potential bias in the methodology and opening up the measurement methods to additional perspectives – it would therefore be recommended that a new measure of creative style be produced that is peer-report rather than self-report, this could be particularly relevant to leadership populations but also for more general populations. There is great debate in the existing leadership literature concerning self-other disparity of measurement – a common observation whereby leaders (on a number of different scales) will rate themselves in a way that is not consistent with the way that their followers rate them (de Vries, 2012). To date, it is not known whether this disparity of rating is a valid consideration in the measurement of creative style, however, it would be naïve to believe that self-report measures alone are the only/best ways to measure these constructs without further research. The suggestion for future research would be to further replicate the observed findings, whilst also further exploring the creative and leadership styles of leaders from multi-source perspectives. This could be approached through a study which involves matched leaders and followers, responding to survey items addressing; their own creative style as well the perceived creative style of the other, their own performance and the perceived performance of the other, and (for control purposes) personality traits. As previously mentioned, this would involve the creation of a new scale for other-rated creative style and other-rated creative/innovative performance, as well as improving upon the reliability of the self-report creative/innovative performance measure used in the current research.

For clarity, in referring back to Figure 2.4 (recreated below as Figure 5.12) which highlights the proposed theoretical framework of the research, the findings and discussion points discussed in relation to Study 2 relate to Research Question 3, illustrated by the blue box in the figure. It is acknowledged that additional research, as outlined above, would be advised to design studies which test a more comprehensive version of both this theoretical framework (by expanding each study design beyond the confines of the current illustrated boxes) and that of the Dynamic Componential Theory. The following chapter will cover more general discussion points which are relevant to the entire thesis and are therefore relevant to the entirety of this Figure.

Figure 5.12 – Proposed theoretical framework for the research



## Chapter 6: Discussion

This final chapter discusses the implications for the research findings outlined in this thesis – specifically in terms of building on the discussion points made in relation to both Study 1 (section 4.5) and Study 2 (section 5.6), as well as looking at consistencies and generalisable contributions across these two studies and the additional exploratory analyses undertaken. The implications are discussed at a theoretical level, stating the contributions to knowledge and theory that have been achieved through conducting this research; and also discussed at a practical level regarding how the findings and conclusions can inform organisational practice. Finally, the limitations of the current research are acknowledged with future research suggestions highlighted.

As a brief summary of the research findings before addressing the associated contributions:

- **Research Question 1** asked '*How robust is the Creative ID measure of creative style, and to what extent can creative style explain variance in performance at different stages of the creativity/innovation process?*'. Study 1 found that after removing some items from the Creative ID tool, it obtained satisfactory fit indices from a confirmatory factor analysis to indicate a five-factor structure aligned to the proposed creative styles. Inter-item reliability statistics were lower than hoped but could be explained by the low number of items in each scale. It was found that certain creative styles were found to account for variance in creative/innovative performance at specific stages of the creativity/innovation process; and in all measures of creative/innovative performance it was seen that creative styles accounted for a significant amount of variance beyond that accounted for by personality traits.
- **Research Question 2** asked '*Is an individual's creative style more state-like or more trait-like in its changeability over time and which factors contribute to observed changes?*'. Based on the results of Study 1, it would be suggested that creative style is generally more trait-like and stable over time as across the participant population as a whole, only one of five creative styles was seen to significantly change. However, some evidence for the development of creative over time was observed in that the Spotter creative style increased for the general population, and the Supporter creative style increased following the promotion to a leadership position.
- **Research Question 3** asked '*Does an individual's creative style relate to their leadership style, and how do these styles at the leader level relate to follower creative/innovative*

*performance?*'. Results of Study 2 imply that an individual's creative style and leadership style are not related; though in certain instances, specific creative styles and specific subdimensions of transformational leadership were seen to positively relate to follower creative/innovative performance – implying that each may a role to play in impacting follower creative/innovative performance, despite being unrelated to each other.

### **6.1. Theoretical Contributions**

This section will present four main theoretical contributions arising from the research which are seen to be consistent across the research presented in this thesis, as well as two further additional theoretical consideration.

Firstly, the research has proposed that the construct of creative style be redefined as:

*Creative styles are individual cognitive or behavioural modes or approaches in which people attempt to be creative and/or innovative – that is, in their attempts to generate novel ideas and implement new ideas, which could include problem/opportunity identification, the introduction, adoption or modification of new ideas, promotion of ideas and practical implementation'*

This brings about the question, why? Why would the definition of creative style need to change in the first place? As described in the literature review chapter (section 2.2.1), historically the definition of creative style has changed from study to study depending on the measurement tool used – this has resulted in little consistency between studies and little to no alignment between the research of creative style and the wider literature relating to creativity and innovation. It has been acknowledged that the area is fragmented, and creative style research seems to represent an island of niche interest that should have links to the rich and broad creativity literature – but to date, the links have not been made, neither through consistent and clear definition, nor through alignment to existing and established theory. All previous research seems to agree that creative style is the way in which an individual prefers to be creative, yet not all previous research acknowledges that this inherently links the construct to the wider field of creativity and the theories within this area – because if creative style is about creative preferences and the pursuit of creativity, how can it standalone as an island of research unrelated to the main field of creativity? These are the reasons for redefining creative style, to firstly broaden the definition to include both creativity and innovation as the two are so closely linked, and secondly to align creative style with established creativity and innovation theory, namely the Dynamic Componential Theory (Amabile & Pratt, 2016). The wording of this definition references 'cognitive or behavioural modes or approaches' (Hughes et al., 2018) which echoes the description of creativity relevant processes from the Dynamic Componential Theory. Of course, to be a truly

worthwhile construct definition that contributes to knowledge and theory, there needs to be supporting evidence that the construct does indeed match up to the definition provided – this brings us to the next point.

Secondly, now the construct of creative style has been redefined with a suggested ‘home’ or link to an established theory – some evidence is required to support both this definition and the construct’s theoretical placement. Amabile and Pratt’s (2016) Dynamic Componential Theory (DCT) refers to ‘Creativity Relevant Processes’ which they state include “cognitive styles, perceptual styles, and thinking skills that are conducive to taking new perspectives on problems, pivoting among different ideas, thinking broadly, and making unusual associations; personality processes, traits, and characteristics that lead the individual to take risks and eschew conformity; and persistent, energetic work styles” (2016, p. 160) – firstly this aligns well to the proposed definition of creative style stated previously: *Creative styles are individual cognitive or behavioural modes or approaches in which people attempt to be creative and/or innovative – that is, in their attempts to generate novel ideas and implement new ideas, which could include problem/opportunity identification, the introduction, adoption or modification of new ideas, promotion of ideas and practical implementation’.*

The current research has provided evidence to support this alignment in two key areas – firstly in terms of establishing a measure of creative style, and secondly in terms of fitting the expectations and mechanisms of the DCT. In the pursuit of measuring the construct of creative style as defined above, support comes from the findings of Study 1 whereby the five creative styles measured by the Creative ID tool align largely as expected to personality traits that should be associated with each (section 4.3.6), providing a level of construct validity in relation to the styles’ measurement, alongside the required reliability of measurement provided by the confirmatory factor analysis. All of this whilst ensuring that the measurement aligns to the proposed definition of creative style, which in turn fits the definition required of a construct in the ‘Creativity Relevant Processes’ section of the DCT. In terms of the construct (as defined and as measured in the research) being a good fit for the DCT, in particular the ‘Creativity Relevant Processes’ element – constructs which fit into this area of the theory would be expected to directly predict individual or small-group creativity at one or more stages of the creative/innovative process – especially in the stages of Preparation, Idea Generation and Idea Validation. Support for these relationships, in terms of specific creative styles predicting self-reported creative/innovative performance at a later time-point was provided in Study 1 (section 4.3.8) whereby the Simulator and Spotter creative styles were seen to significantly predict idea generation performance; and Selector and Supporter creative styles significantly predicting idea validation

performance. This is further supported by the additional analyses following Study 2 which replicated three findings from Study 1 (section 5.5.3), still further evidence comes from Study 2 which demonstrated that the Supporter creative style of a leader can (in some instances) significantly predict the creative/innovative performance of followers (section 5.4.4).

Furthermore, in considering creative style's inclusion as part of the DCT, it is important to consider not just where the construct best fits in the model – but also to consider the other elements of the model to ensure that there is no ambiguity about where the construct of creative style best fits. The suitability of this construct to be part of the 'creativity relevant processes' element has been discussed above – this leaves two other elements which are seen to be predictors of individual and small-group creativity; intrinsic and synergistic extrinsic motivation, and skills in the task domain. As previously discussed, creative style refers to cognitive or behavioural modes or approaches in which people attempt to be creative and/or innovative – making this construct entirely about the way in which people think and act in the pursuit of creativity, not about what intrinsically or extrinsically motivates individuals to think or act in such ways; and also not a measure of skills, knowledge or performance in a relevant task domain. All of this adds support for the inclusion of creative style as a creativity relevant process in the Dynamic Componential Theory as defined in the current research. It is proposed that this alignment of creative style to a well-established theory constitutes a valuable contribution to knowledge in the field. Unfortunately, a suitable measure of preparation performance was not established for use in the current research and would be recommended for inclusion in future research.

Thirdly, the findings stated above outline the observed relationships between creative style(s) and creative/innovative performance, demonstrating a level of criterion validity. In terms of a theoretical contribution in this area, the findings from Study 1 are strengthened in this area given that the stated relationships were found after controlling for personality traits. One of the enduring criticisms and critiques of previous research into creative style is that dominant measure of creative style (The KAI) has not accounted for variance in job outcomes beyond that which is accounted for by personality traits, leading to the title of von Wittich and Antonakis's (2011) paper, *'The KAI cognitive style inventory: Was it personality all along?'*. This research has demonstrated that the way in which creative style is now defined and measured, provides a way of tapping into something beyond personality traits in the prediction of creative/innovative performance. It is suggested that this is also a valuable contribution to knowledge and theory in this area. Furthermore, these results indicate, in contrast to the position held by Kirton etc., that specific creative styles do relate to performance at

specific stages of the creative/innovation process – this provides some evidence to support a stance whereby certain creative styles can be considered ‘better’ or at least more fit for purpose in particular creative/innovative situations.

Fourth and finally, the research has contributed to the academic field through the validation of a new measure of creative style, the Creative ID. Based on the published information available on alternative measures, the Creative ID differs from those that have been previously created in a number of ways – firstly, after some amendment of the original 40-item tool, reducing it to a 19-item tool based on the outcome of exploratory factor analysis; the shortened measure has obtained acceptable levels of model fit for a five-factor model structure as indicated by confirmatory factor analyses in both Study 1 and Study 2 (sections 4.3.3 and 5.3.3). Additionally, this tool is aligned to the Dynamic Componential Theory of creativity and innovation – definitionally, it is aligned to the area of creativity relevant processes featured in the model, and in terms of criterion validity there is evidence to support the claim that it aligns to the stages of creative/innovative performance as outlined in the model. In comparison with previous measures, the FourSight tool is explicitly aligned to the model of Creative Problem Solving (section 2.2.4) which is not as broad and wide-reaching as the Dynamic Componential Theory, whilst other measures such as the KAI are not clearly aligned to any established theory, as well as the KAI not recognising the multidimensionality of the creative style construct. Furthermore, in contrast to other measures of creative style (and in alignment with the creativity relevant processes of the Dynamic Componential Theory), Creative ID includes a style which is not just about individual achievement – the Supporter creative style is absolutely about the individual and their ways of working, but accommodates a preference which is more focused on supporting and developing the success of others. This is something not present in previous measures of creative style and the results of the research indicate that this is a relevant creative style to consider in the prediction of creative/innovative performance.

It should be addressed whether creative style (as measured using the five styles of the Creative ID tool) comprehensively covers the preferences relevant to behaviour at all the stages of creative/innovative process outlined in the Dynamic Componential Theory and others – based on the definitions of the creative styles and the descriptions provided of the process stages (as outlined in Table 2.5), there is significant coverage at the construct level in terms of ensuring the creative style preferences align to each element defined within the creative/innovative stages. Referring back to Table 2.2 which outlined popular innovation processes in the literature, stages which do not feature in the Dynamic Componential Theory (Amabile & Pratt, 2016) include ‘coalition building’ (Kanter, 1988) and ‘idea promotion’ – it is important to recognise that there are multiple models of



creativity/innovation and in order to claim that the Creative ID is a valuable measure in this domain, the creative styles measured should also address the stages of such alternative models. It could be posited that coalition building absolutely aligns to the social and collaborative nature of the Supporter creative style; whilst idea promotion (which is also referenced in our chosen definition of creative style adapted from Hughes et al., 2018) would align to the communicative elements of the Sculptor creative style in ensuring that things are explained in simple, tangible and concrete ways. Additionally, it should be recognised that the Creative ID is just one of a number of existing measures of creative style – as previously discussed, conceptually it aligns closely to the FourSight measure, albeit with the addition of the ‘other-focused’ Supporter style; whereas the KAI has a very different structure of a single continuum of adapting (similar to the Sculptor) vs innovating (similar to the Stimulator) – it could therefore be surmised that the Creative ID measure does cover everything that the KAI does, yet has provided evidence for these style being distinct, rather than direct opposites.

As discussed throughout this thesis, at the measurement level of creative style the Creative ID tool can be improved and will be subject to review based on the findings of this research and thesis. In addition to providing information on the factor-structure, item reliability and suitability of the Creative ID tool, a further recommendation will be made to Creative Creatures to ensure that in the development of future versions, that not only the construct definitions be considered when selecting/creating new items, but also the creative/innovative process definitions to which the creative styles should align.

Overall, this contribution to the literature is one of the more substantial achievements of this research in that there is now an accessible, well-structured measure of creative style which is aligned to an established theory of creativity and has been shown to predict creative/innovative performance in both the self and others. This also adds weight to the argument that creative style is a multidimensional construct, consisting of a number of distinct factors rather than based upon a single continuum of measurement as proposed by Kirton and the KAI.

There are two more things to mention which may not be considered significant contributions in their own right at this time, yet can provide a starting point and direction for future research which can make a more significant contribution to the understanding of creative style.

Firstly, in terms of the nature of creative style over time it was observed in Study 1 that generally, across four of the five measured, creative style was found to be relatively trait-like and unchanged over time when considering the entire research population – this could suggest a level of general

stability for the construct, as well as providing support for the test-retest reliability of the Creative ID measure. The exception to this general finding is that the Spotter creative style did change for the population as a whole over the six month period between the two data collection timepoints. In terms of explaining this, it is not immediately apparent why this particular creative style may be more changeable over time than the others – however, following further research it may be seen that this creative style has a predictable development pattern as has been seen with personality traits (such as openness to experience which has been seen to positively correlate with the Spotter creative; and has been seen to increase earlier in life before decreasing later in life – Costa et al., 2019). The Spotter creative style in particular may be a style which develops over time – due to the nature of spotting opportunities, patterns and bringing together disparate things in beneficial ways; this may be a tendency or way of working which benefits from workplace experience and seeing how things have been done before, to then apply similar methods, or pursue previous avenues for opportunities, more often or more effectively in the future. Alternatively, referring back to the elements which distinguish states from traits (Fridhandler, 1986), a trait-like construct is considered something which can be interrupted at times before reverting back to the norm, making it relatively unchangeable over time – there is the possibility that for some reason in this participant population, at the time of measurement, something caused the trait-like Spotter creative style to be interrupted (increased) and additional measurements at future dates could demonstrate that it would revert back to a relatively unchanged level over time.

Furthermore, when looking into the change in creative style over time, the results suggest that observed changes (though these may be minor) across all five creative styles may in some way be due to the experience of being promoted to a leadership position, which was found to be the case when using regression analyses to predict the change in creative styles over time. However, it should be clarified that being promoted to a leadership position is different to simply being in a leadership position (which was also controlled for as a demographic variable), and it is the former not the latter which was found to be a significant predictor. Therefore, this may tell us something about the kind of mechanism which may contribute to a change in creative style over time – it is not simply ‘being a leader’ but the recent experience of being promoted into that position which may bring about (for example) increased motivation (Ryan & Deci, 2000), self-efficacy (Dimotakis et al., 2017) etc. This inconclusive finding regarding the changeability of creative style over time, and the mechanism by which it can change, provides an interesting avenue for future research to explore as explained in (section 4.5.4).

Secondly, regarding the relationship between creative style and transformational leadership it was observed in Study 2 that, in contrast to the hypothesised relationships, these constructs do not seem to be significantly related – at least not in terms of an individual’s creative style predicting their leadership style. There were, however, a number of statistically significant correlations between creative styles and subdimensions of transformational leadership (section 5.4.3) indicating that they may be related, but not causally. Given that both the creative style of a leader and the subdimensions of transformational leadership were found to have significant relationships with measures of follower creative/innovative performance, this opens up another avenue of research to explore in greater depth how each of these constructs impacts follower creative/performance, and if they are utilising similar mechanisms (such as motivation, self-efficacy, etc.) to do so.

## **6.2. Practical Implications**

The main practical implications of the research have been covered already in the respective discussion chapters for Study 1 (section 4.5.2) and Study 2 (section 5.6.2) – these focus on three areas of; creative style measurement, understanding/application of creative style, and creative style(s) in a leadership context. It should also be noted that overall, both research studies presented in this thesis utilised participant samples that could be considered to be predominantly of a ‘Western’ culture with the majority of responses coming from nations such as the UK, USA, Spain, Portugal, and Netherlands; additionally, the majority of respondents had either a Bachelor’s or Master’s degree and of course all participants were employed at the time of participation. Therefore, when making any inferences about the data, or how to generalise or apply this knowledge in a practical setting, these demographic boundary conditions should be taken into account.

Firstly, the validation of a new measurement of creative style, the Creative ID, has been discussed throughout this thesis. In terms of practical application, this has resulted in a tool which was found to have a suitable factor-structure across both research studies, and at its now shorter form of 19-items, is a more attractive proposition for practitioners wanting to get an insight into the creative style of people in an organisation, by using a reliable, relatively short and easy to administer online survey tool.

Secondly, the use of this tool has practical application beyond simply individual insight into one’s creative style preferences – based on the findings of Study 1 (section 4.3.8) it can be seen that understanding the creative style preferences of an individual can be related to their level of creative/innovative performance across different stages of the creative/innovative process. This has

obvious implications for recruitment or the creation of projects teams whereby people with particular creative style preferences can be 'matched' to roles and activities that are best suited to them based on the research findings. Of course, future research into this would be beneficial, especially in terms of utilising a robust and suitable measure of creative/innovative performance relevant to the specific business context in question. Further research into the nature of creative style's changeability over time would also have significant implications for practical application should this be better understood – Study 1 (section 4.4.1) indicated that an individual's creative style can change over time, and being promoted into a leadership position may have some impact upon such a change – should this be better founded, or should other work-life events or mechanisms be found to have an impact on creative style over time, this change in style could then be planned for, or even manipulated through workplace training or through introducing influential events and experiences, to maximise the benefits for overall creativity/innovation performance.

Thirdly, based on the findings of Study 2 (section 5.4.4) it can be seen that understanding the creative style preferences of a leader can be related to the creative/innovative performance levels of their followers in some specific instances cases. Again, practical applications here could include the recruitment of, or introduction of, particular individuals into leadership positions when high performance from followers at particular stages of the creative process are required. Furthermore, when creating such project teams which are working through the creative/innovative process, it may be beneficial to consider both the creative style and leadership style of leaders. Though in need of significant future research, these findings could have meaningful practical implications for creative/innovative performance through the increased understanding of creative style preferences at the individual, leader and interaction levels. It must be noted that, as outlined throughout this thesis, some relationships have been identified between variables – however, this should be tempered by the fact that many hypothesised relationships were not observed, and that these findings came from a fairly small sample size. Although the findings outlined in this research may be statistically significant, it would be advised that further rigorous research be conducted in these areas before meaningful practical decisions were made on the basis of the results. One additional thing to note is that although the Supporter creative style is seen to be related to leadership in that there is a relationship with follower creative/innovative performance – substantial relationships between creative style and transformational leadership were not found, which could indicate that when looking to recruit for, or develop, desirable leadership behaviours or leaders who are perceived as highly effective, creative style is neither a predictor, not a barrier to such roles or perceptions. One such potential explanation for the lack of relationship between the Supporter creative style and

transformational leadership – in particular the subdimension of supportive leadership – could be the boundary conditions of the measures themselves; firstly, the Supporter creative style is primarily associated with supporting others to achieve in the domain of creativity, whereas supportive leadership is focused on the support of others through all workplace situations and endeavours, it is a much broader scope of supportive behaviour. Secondly, when looking into the specific items of measurement for the Supporter creative style, these are very much about creating an environment for others to thrive, it is almost entirely focused on the achievements of others. In contrast, the items measuring supportive leadership take into account the feelings and needs of others but it is still very much a measure of the leader's own performance, it is leader-oriented with recognition of others – therefore, despite the very similar names and definitions, these measures (based on the items used) do seem to tap into quite separate constructs which may not be related as initially expected.

In terms of mechanisms for the Creative ID tool and the presented research findings having a practical impact in industry, one method of gaining exposure to a wider audience, whilst also obtaining an independent expert review would be to submit the Creative ID tool for inclusion in the British Psychological Society's (BPS) Psychological Testing Centre Library. This would involve submitting the full tool to the BPS, along with the associated research demonstrating the tool's reliability and validity – allowing the BPS Testing Standards Committee to undertake an independent review process, resulting in a published report on the tool which is publicly available. Additionally, the tool and the knowledge gained through research, will continue to reach wider audiences through the corporate training delivered by Creative Creatures. To date, the previous versions of the tool have been used to create over 10,000 profiles for individuals, highlighting their own personal creative style preferences, which then forms the basis of corporate creativity and innovation training to take the self-awareness provided by the tool, before placing this knowledge into the context of the individuals, their job role and organisation, to better understand where they best 'fit' and add most value when working in particular teams, on particular projects, or at specific stages of the creative/innovative process. It is also proposed that the Creative ID tool could be used in conjunction with other existing tools of creativity and innovation, such as the CLEAR IDEAS framework (Birdi, 2021; Jones-Chick et al., 2022) – a framework which helps to enable both the creation and implementation of ideas through following a series of 10 practical steps. This framework is used in workshops with both academic and corporate audiences – it is proposed that should these participants also complete the Creative ID tool and gain awareness of their preferred creative styles, how these styles behave over time and how they relate to different stages of the creative/innovative process; this could further enhance the effectiveness of the CLEAR IDEAS structure as both individuals and teams would have greater insight into where to

place their people and their efforts for optimal results. Finally, the Creative ID tool is commercially available for individuals to purchase, whilst a certification course is also available for practitioners who wish to become licensed to use the tool and deliver the associated content at a larger scale with their own clients.

### **6.3. Limitations**

The main limitations of the research presented in this thesis are consistent across both Study 1 and Study 2, these are detailed in the relevant discussion chapters (section 4.5.3 and 5.6.3) and in summary, are focused on three key areas: precision of measurement, length and depth of methodology, and size of participant sample.

Firstly, and most prominently, the issue of precise measurement is present across the research presented in this thesis. Firstly, the majority of measures used in the research, whether these had been utilised from previous published research in the same format or whether these had been taken from previous research yet combined in new ways – largely these measures required some amendments to be made to obtain suitable model fit and reliability statistics from a confirmatory factor analysis. Additionally, in the case of measuring creative/innovative performance in both Study 1 and Study 2, entire scales were dropped from the measure to achieve a suitable level of reliability. It has been detailed elsewhere in the thesis how a more reliable measure of creative/innovative performance, aligned to the Dynamic Componential Theory, could be developed for future research purposes. Furthermore, there is great debate in the literature regarding the robustness of measures of leadership styles, and if they do in fact measure leadership behaviour or simply leader intentions and attitudes which may not then manifest themselves in a visible or experiential way. As the research in this thesis is primarily focused on creative style, creativity and innovation, it would be careless to delve into the leadership style field and make broad statements regarding the measurement methods; however, this is an area to keep an eye on, and to ensure that rigorous, respected and well-tested measures are used in future research wherever possible.

Secondly, regarding study length and depth, it has been discussed as part of Study 1 that the time-separated element of the research – where the potential changeability of an individual's creative style over time was explored – would benefit from a greater timespan (as personality traits, for example, have been found to change in research greater than three years), and from a greater number of data collection point to more accurately determine how creative style changes over time (if at all) beyond

the confines of a simple linear relationship. A future research suggestion incorporating this design is offered in section 4.5.4.

Finally, the size of a participant sample is regularly a concern of quantitative researchers who want to ensure that both their research findings have a suitable level of statistical power, and also to give the best possible level of generalisability to a wider population. In Study 1 it was mentioned that the sample size of approximately 300 was considered borderline (Tabachnick & Fidell, 2014) in terms of its suitability for the use of Structural Equation Modelling techniques which provide a deeper level of rigour compared to other methods which do not use latent variables in the analyses. Additionally, Study 2 highlighted that there were not as many Level 2 (i.e. leader level) participants as would have been hoped for – added to this the cluster size (number of followers per leader) was also considered to be quite small. Each of these points would be considered a limitation of the research, either due to making more sophisticated statistical techniques unsuitable, or simply limiting the statistical significance of the analyses that are used. Future research suggestions incorporating remedies to these limitations are offered in sections 4.5.4 and 5.6.4.

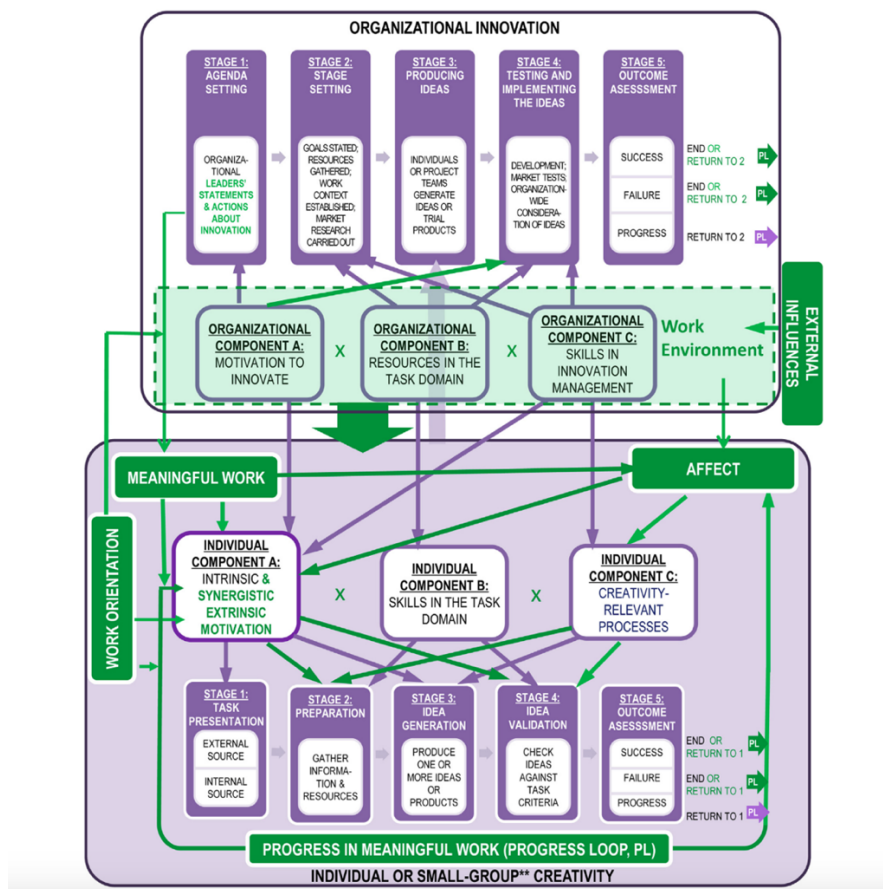
#### **6.4. Future research suggestions**

Future research suggestions based on the findings of the studies presented in this thesis are presented throughout the discussion chapters of Study 1 (section 4.5.4) and Study 2 (section 5.6.4). To briefly summarise, four areas of future research, together with suggested methodologies are suggested:

- To replicate the findings of Study 1 regarding the relationships between creative style and creative/innovative performance using objective measures of creative/innovative performance relevant to different sectors or industries.
- To improve upon the design of Study 1 in terms of exploring the changeable nature of creative style over time by increasing the timespan of the research and the number of data collection points.
- To create and validate a new measure of creative/innovative performance across the five stages outlined in the Dynamic Componential Theory (task presentation, preparation, idea generation, idea implementation, outcome assessment). Then to use this measure to replicate both the findings of Study 1 relating to the relationship between creative style and creative/innovative performance at the individual level; and to further explore the relationships between a leader's creative style and follower's creative/innovative performance.

- To replicate Study 2, albeit with a larger participant sample, yet use measures of creative style, leadership style and creative/innovative performance that are multi-source/multi-perspective. This research highlighted the self-other disparity of ratings of transformational leadership behaviour and this disparity may also be present in ratings of creative style and creative/innovative performance.

Figure 6.1 – The Dynamic Componential Theory of Creativity and Innovation taken directly from Amabile and Pratt (2016, p. 165)



One additional research area not yet discussed in this thesis would be to utilise all of the improved measurement methods outlined above to more fully explore the position of creative style within the structure of the Dynamic Componential Theory. As per Figure 6.1, creativity relevant processes are seen to impact upon stages of the creative/innovative process; however, these processes themselves are theorised to be influenced (either directly or indirectly) by factors such as affect, meaningful work and skills in innovation management; as well as having theorised interaction effects with motivation and skills in the task domain. It is not necessarily suggested that the entire model be tackled in a single study as the sheer number of variables included would require a very large participant sample and complex analysis, though this would be ultimately beneficial if possible. However, it would be



suggested that each individual direct effect be systematically explored in turn, in a series of research studies which aim to both provide supporting evidence for the inclusion of creative style within the Dynamic Componential Theory, as well as to continually develop and reconfirm the robustness and suitability of the measurement scales developed, and the Creative ID tool. For example, when considering creativity-relevant processes – measures in this area would include (as per the areas mentioned in the Dynamic Componential Theory) creative style, personality traits, creative self-efficacy and trust in leaders (Amabile & Pratt, 2016, p161); these constructs would be measured alongside measures of motivation and measures of relevant skills (i.e. knowledge or technical skills relevant to the context in which the participants work). This would ensure that the three main ‘individual components’ in the Dynamic Componential Theory were addressed – and in exploring how these constructs predict levels of performance across the five stages of the creative/innovative process, it would be expected that each of these areas relate to the specific stages of performance stated in the model, as well as each of the three areas showing a level of distinction from each other. A further level of complexity could be added by including measures of affect, work orientation and meaningful as predictors of the three main individual component groups – this would enable a yet more comprehensive test of the Dynamic Componential Theory with the inclusion of creative style. Conducting this research across two (or more) timepoints would help to minimise common method bias, as would the use of objective measures of performance where possible.

A further suggestion would be to build upon the previous MSc level research conducted by the author of this thesis (Rabbetts, 2010) in exploring the ‘dark side’ of creativity and creative styles. Whereas this previous research looked into constructs at the individual, interpersonal and organisation levels which were expected to impact upon the creative/innovative performance of individuals; future research could expand upon the research presented in this thesis to further explore the potential negative impacts/relationships of creative style. In taking the approach of Study 2 whereby leaders and followers are matched whilst providing independent data, it would be interesting to explore whether levels of creative style seen to be beneficial to a leader, are in fact inhibiting or not advantageous to their followers through the mechanism of creative ‘blockers’. Specifically, it would be interesting to explore the mechanisms by which such an inhibitory impact on follower performance could occur – for example, explore whether strong preferences for certain creative styles correlate with, or predict, levels of creativity inhibiting constructs as perceived by followers at the individual level (lack of creative self-efficacy, lack of creative intrinsic motivation), interpersonal level (workplace incivility) and organisational level (lack of relevant training, lack of tolerance of failure, lack of support for risk taking, time pressure, lack of autonomy). Furthermore, with greater participant numbers

(which is a recommendation for all future research outlined in this thesis) it may be possible to look into potential relationships between the creative style of a leader and constructs identified as ‘creative blockers’ at the individual, interpersonal and organisational levels. The present research has identified that in certain instances, a greater preference for a leader’s creative style/s can correlate with greater follower performance at one or more stages of the creative/innovative process – however, there is the possibility that certain leader creative styles have differing relationships with factors seen as creative blockers which may provide additional insight into the mechanisms by which a leader’s creative style relates (or not) to follower creative/innovative performance. For example, if a leader has a high level of the Stimulator creative style with a tendency to come up with a lot of original and diverse ideas, this may relate to a lack of creative self-efficacy or lack of creative motivation in their followers as those followers see the leader setting such a high standard/frequency when it comes to idea generation that they feel as though they could never match up to this level themselves (lack of self-efficacy), or feel that there is no point in generating ideas themselves as it has already been done to a sufficient level (lack of creative motivation). Alternatively, a leader with a high level of Selector creative style – which tends to be very objective, goal-focused and narrows down options – may result in a lack of support for risk taking in their followers as the leader’s preferred way of working is not to be divergent, take risks and come up with new ideas; but to be convergent, evaluative and make logical progress toward a strategic end goal.

Findings from this research would potentially be valuable at the theoretical level in terms of establishing more knowledge relating to the construct of creative style, how it impacts upon performance and relates to other constructs; but also practically, teams and organisations could gain a valuable insight into the antecedents of creative ‘blockers’ and where best to place leaders in the organisation/project to ensure that followers have the best possible chance of performing to a high level at different stages of the creative/innovative process.

Finally, it would be interesting to take the insights provided by the current research and relate these to potentially the largest change the working world has seen in a generation – artificial intelligence (AI). It is recognised that to date, creativity has been almost exclusively in the domain of humans, yet with the rapid progression of AI development, some researchers believe that “the multiple enhancements in the quantity and quality of information available are most likely to bolster creativity at all levels” (Grilli & Pedota, 2024 p235). With routine tasks able to be automated, this potentially frees up the time of humans to be more effective and efficient (Mikalef & Gupta, 2021), however, given that AI can (given the required prompts) come up with ideas and alternate uses – does this

render our traditional metrics of measuring the creativity of humans obsolete? Will human creativity as we know it be required in the future? It could be argued that AI is only useful when prompted effectively, which currently needs to be done by humans – and can be considered a creative skill/act/preference in itself aligning to the task presentation, preparation and idea generation stages of the Dynamic Componential Theory (DCT). Additionally, the output provided by AI is only deemed valuable and worthwhile upon the evaluation of humans – again aligning to stages of the DCT in idea validation and outcome assessment. Therefore, it is proposed that a future research study could be structured around the DCT, including creative style as a creativity relevant process, whereby the specific performance activities are focused on the prompting of AI and the evaluation of AI outputs in line with the DCT stages of creativity/innovation. This could be done with an experimental group that are working with AI in the creative/innovative process, as well as a control group who are performing ‘business as usual’ in their navigation of the creative/innovative process – with a shared objective organisational measure of performance (such as net spend, income generated, time/resource/efficiency metrics) as an outcome variable by which to compare the two groups. To clarify, both groups would report their performance levels across the five stages of the creative/innovative process as per the research presented in this thesis; though the experimental group would be working to generate AI inputs and evaluate the outputs, and the control group would be ‘manually’ performing the tasks as usual. Performance between the groups would be assessed, whilst exploring whether specific creative styles have an impact on AI use at different stages of the creative/innovative process. The purpose of this research would be to highlight how impactful (if at all) the use of AI can be in a creative/innovative process, whilst also exploring the importance that uniquely human factors (such as creative styles, personality styles, motivation, etc.) have, and will continue to have, relevance at different stages of the creative/innovative process involving human-machine hybrid collaborations.

In summary, the research presented in this thesis was structured to gain a better understanding of the construct of creative style, as well as explore relationships between creative style and other constructs as illustrated in Figure 2.4 (recreated below as Figure 6.2). However, as illustrated by the constructs in the framework being split into different Research Questions, and ultimately different studies, the full theoretical framework has not been tested. It has also been noted a number of times throughout the discussion points raised in this thesis that the logical theoretical ‘home’ proposed for creative style – the Dynamic Componential Theory (Amabile & Pratt, 2016) – also has not been tested in its entirety. What the current research has contributed, however, is a number of interesting relationships and supported hypotheses which both add to the currently lacking scientific knowledge

around the construct of creative style, and provide a basis for future research to take this theoretical understanding and associated implications to a deeper level. An updated theoretical framework has therefore been provided (Figure 6.3) to highlight the significant relationships that were both hypothesised and observed in this research – as mentioned throughout the relevant discussion chapters of this thesis, a number of hypothesised relationships were not observed, as well as significant relationships which were observed without being hypothesised. Therefore, for the purpose of summarising the research findings, it is these supported hypotheses which have been illustrated and it is therefore proposed that these constitute a new contribution to scientific and theoretical knowledge as well as a basis for conducting future research.

Figure 6.2 – Proposed theoretical framework for the research

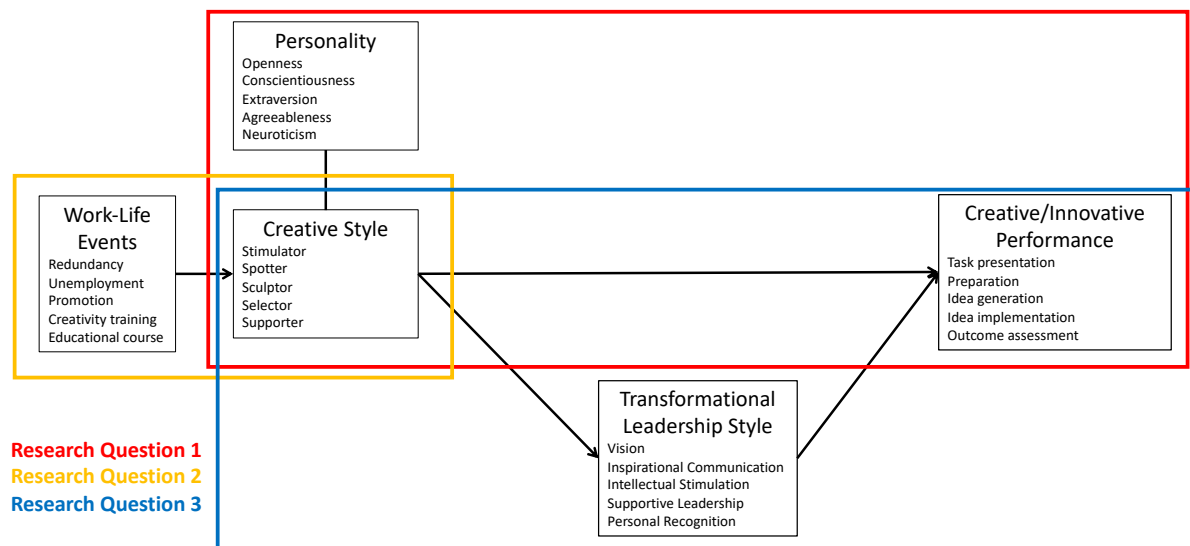
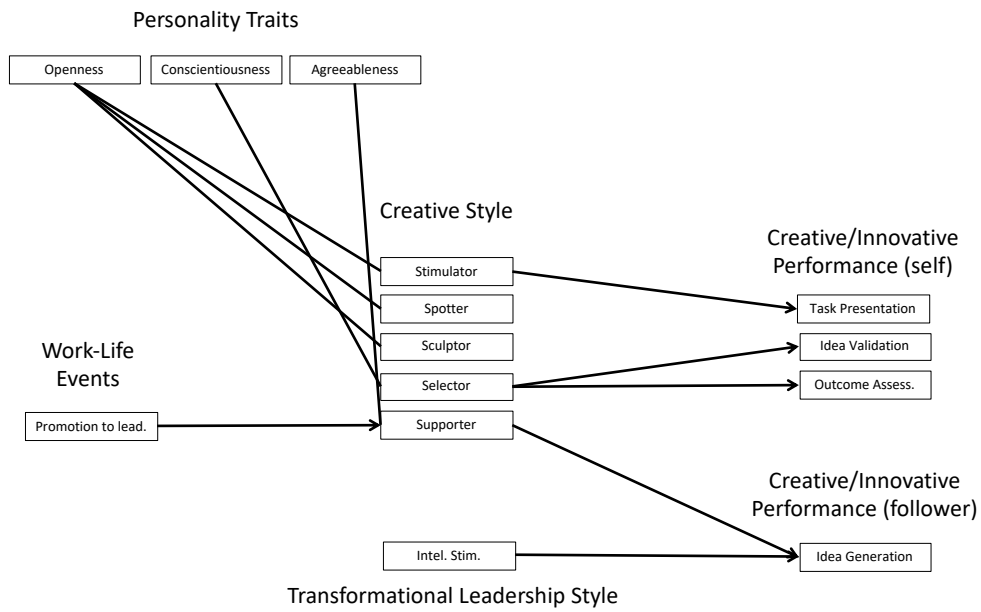


Figure 6.3 – Observed hypothesised relationships in the context of the original proposed theoretical framework



## Chapter 7: Conclusion

In bringing this thesis to a conclusion, this final chapter reflects upon; the research questions at the centre of the research, how the findings of the studies contribute to our knowledge in addressing those research questions, and the contribution this thesis has made to theory, knowledge and future research.

The importance of creativity and innovation in the workplace have been noted throughout this thesis, with a review of the existing literature highlighting that research into creative style is relatively limited, the nature of an individual's creative style preference over time is unknown, that the construct has limited grounding in established theory, is usually thought to be unrelated to creative/innovative performance, and that it has been questions whether creative style is simply an element of personality. Additionally, the existing definitions of creative style were found to be varied and could be considered too narrow in their scope, which is reflected in their measurement. Of the existing research into creative style, this is focused on the individual only – whereas creativity and innovation are rarely individual pursuits and the importance of leaders has been overlooked, both in terms of how leaders as a population are a group of particular interest in that they are required to create/innovate as part of their role; but also in terms of the impact a leader can have on the creative/innovative performance of their followers. Based on the literature review three research questions were formulated which were addressed through two distinct studies:

- *Research Question 1: How robust is the Creative ID measure of creative style, and to what extent can creative style explain variance in performance at different stages of the creativity/innovation process?*
- *Research Question 2: Is an individual's creative style more state-like or more trait-like in its changeability over time and which factors contribute to observed changes?*
- *Research Question 3: Does an individual's creative style relate to their leadership style, and how do these styles at the leader level relate to follower creative/innovative performance?*

In addressing Research Question 1, results from Study 1 suggest that the Creative ID measure of creative style, with some amendments, demonstrates a satisfactory fit to a five-factor model as hypothesised, with each of the five creative styles showing expected relationships with the Big 5 personality traits. Furthermore, it was noted that in all measures of creative/innovative performance included in the research, one or more creative styles were found to account for additional variance in performance beyond that accounted for by the Big 5 personality traits. In addressing Research Question 2, results from Study 1 suggest that the creative style preferences of an individual are

generally stable over time, but can change, with the experience of being promoted to a leadership position a work-life event that could contribute toward such a change. Finally, in addressing Research Question 3 the findings from Study 2 suggest that although there is no relationship between a leader's creative style and their transformational leadership style behaviours, there are certain positive relationships between a leader's creative style and their followers' creative/innovative performance, as well as certain positive relationships between subdimensions of transformational leadership and follower creative/innovative performance. Additionally, some of the relationships observed in Study 1 between an individual's creative style and their creative/innovative performance were replicated.

Finally in terms of the contributions made by this thesis, these can be summarised in the following 8 areas.

1. A new definition of creative style has been proposed: *'Creative styles are individual cognitive or behavioural modes or approaches in which people attempt to be creative and/or innovative – that is, in their attempts to generate novel ideas and implement new ideas, which could include problem/opportunity identification, the introduction, adoption or modification of new ideas, promotion of ideas and practical implementation'*. It is suggested that this definition of creative style is broader than those which has come before, yet still relevant to the previous work, being wide enough to incorporate the creative styles as defined by Kirton, Puccio, and others. Additionally, it is suggested that this wider scope allows for the construct of creative style to be better integrated into the wider creativity and innovation literature which encompass elements of creative/innovative performance in their theories.
2. Our understanding of the construct of creative style has been enhanced through the validation of the Creative ID tool – going some way to confirm that the construct itself was too narrowly defined previously, and that there are (at least) five creative styles which are distinct of each other, and all have some relationships with elements of creative/innovative performance.
3. Identified relationships between creative styles and personality traits were observed as expected based on the definitions of the constructs and underlying styles/traits. This is a case of a bottom-up, practical approach to defining a construct through practical observation (in this case creative style) being linked to theory and literature, before empirically testing those hypothesised relationships.
4. The identified relationships between certain creative styles and creative/innovative performance at specific stages of the creative/innovative process is something which had not been previously identified. Furthermore, additional variance in creative/innovative performance was accounted for by creative style(s) beyond that which was already accounted for by personality traits. This

contradicts previous arguments put forward in the literature that creative style was simply a subset of personality and added nothing additional in terms of predicting outcomes such as performance.

5. The identification that an individual's creative style is generally stable, but can change over time is a characteristic of the construct which was previously unknown – furthermore, the identification of work-life events which could contribute to such a change provides additional theoretical contribution as well as a basis for future research.
6. The identification of certain positive relationships between the creative style of a leader and the creative/innovative performance of their followers is an addition to the existing knowledge in the area – a relationship between constructs which had previously not be explored in the discoverable research.
7. Finding evidence that the creative style of a leader and their transformational leadership style behaviours are not linked – although each of these constructs has some relationships with follower creative/innovative performance, based on the results of the current research, these constructs themselves are not related – implying that the variance in follower creative/innovative performance accounted for these constructs (in the way that they are measured by the Creative ID and Transformational Leadership Scale respectively) is separate and not shared. This does require further exploration with a much larger sample size.
8. Finally, it is proposed that a basis for a contribution to the Dynamic Componential Theory (DCT) has been established whereby creative style as a construct could be considered as a specific inclusion in the model under the broader heading of creativity relevant processes. This suggestion is made on the basis of creative style being defined in a way that aligns to the existing definition of 'creativity relevant processes' in the DCT, a measure of creative style in line with this definition established, and research findings providing some support for the observation of the expected relationships and mechanism outlined in the DCT (namely creative style(s) predicting creative/innovative performance at multiple stages of the creativity/innovation process). However, it is acknowledged that more comprehensive research, including more predictor variables present in the DCT should be conducted to further establish the precise role creative style has to play in this theory.

It should be noted that all significant relationships noted throughout this research be considered in the wider context that many of the hypothesised relationships were not observed, and that these findings (Study 2 in particular) came from a fairly small sample size. Although the findings outlined in this research may be statistically significant, it would be advised that further rigorous research be



conducted in these areas before meaningful practical decisions were made on the basis of the results. Based on the contributions outlined above, bearing in mind the limitations of the presented research (outlined sections 4.5.3, 5.6.3 and 6.3), it is proposed that the current research has provided a valuable basis from which to base further research to more comprehensively explore the relationship between creative style and creative/innovative performance within the structure of the Dynamic Componential Theory. It is suggested that further research could go into greater depth in understanding the specific mechanisms by which an individual's creative style preferences can change over time. In terms of future scale development and improvement it is suggested that as well as creating a creative style measure that is worded in such a way to ensure more accurate measurement of style (not performance), an 'other-focused' measure of creative style could also be developed. Furthermore, a quickly developing topic in the area of creativity research is that of artificial intelligence (AI), it is proposed that through future research the benefits of AI could potentially be better understood, both in terms of which human creative styles are best suited to getting the best performance from AI at different stages of the creative/innovative process, but also in terms of how AI could potentially benefit human performance at different stages of the creative/innovative process.

In conclusion, creative style is an under-researched area of research, which logically and theoretically should relate to the vast and rapidly expanding research area of creativity and innovation. The current research identified that creative style research was a niche area disconnected from the wider literature. It is proposed that this thesis and the presented research have made progress in aligning creative style research with the wider field, making logical and theoretical links, finding relationships between creative style and other constructs which were previously unidentified and providing a valuable basis for future research. It is hoped that future research builds on the findings of this thesis, to better understand the individual preferences that underpin an outcome seen as more important than ever in the working environment – creativity.

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## Appendices

### Appendix 1: Systematic literature review: Measures of creative style

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## **Appendix 2: Measures: Study 1**

### **Creative style – Creative ID**

Full 40-item version of the tool used in both Study 1 and Study 2. An asterisk denotes the items that were retained for inclusion in the research as a refined 19-item tool following the EFA and CFA processes. The response scale is a 6-point Likert scale from 'strongly disagree' to 'strongly agree'.

#### **Stimulator items**

- 1. I tend to open up new avenues of thinking rather than closing things down
- 6. I am always able to come up with lots of ideas on the spot
- 11. My inspiration for ideas comes from lots of different sources\*
- 16. I generate more ideas than I can realistically take forward at any one time\*
- 21. I am never short of ideas
- 26. My approach to overcoming challenges is usually quite different to that of other people
- 31. I have an insatiable curiosity about most things around me\*
- 36. Ideas are always popping into my head\*

#### **Spotter items**

- 2. I easily identify potential ideas from only small amounts of information
- 7. I am good at seeing new opportunities
- 12. I can easily combine seemingly unrelated pieces of information to generate a new idea\*
- 17. I am able to discover the beginnings of powerful ideas amongst a lot of rubbish\*
- 22. I can easily synthesise large amounts of information to spot the gem of an idea\*
- 27. I often rely on my intuition when generating solutions
- 32. I am usually the first to see the potential in a new idea in its early stages\*
- 37. I am able to imagine how an initial thought can grow into a big idea

#### **Sculptor items**

- 3. It is easy for me to develop half-formed ideas further\*
- 8. I am good at communicating complex ideas in a simple way
- 13. I articulate my ideas to others using rich and colourful language
- 18. I take the lead in making ideas tangible and concrete
- 23. I easily articulate ideas in other ways than words alone\*
- 28. I am good at shaping a story to sell a point of view as strongly as possible
- 33. I am good at building on an existing idea to make it even better and stronger\*
- 38. I naturally communicate my vision of the idea in a way others find easy to understand

#### **Selector items**

- 4. I am good at asking the right questions to separate good from bad ideas\*
- 9. It is easy for me to work with a variety of information and data when making decisions\*
- 14. I am good at picking the right idea to take forward\*

- 19. I can list the pros and cons of an idea easily\*
- 24. When making decisions, I weigh up hard facts with what my intuition tells me
- 29. I consider the commercial impact of potential ideas before choosing the best one
- 34. I always review my decisions as it helps me make better ones in the future
- 39. I can make a good argument for selecting which ideas to take forward

#### **Supporter items**

- 5. I am good at facilitating discussions between individuals to help them generate new ideas
- 10. When working as a new project team, I take the lead in establishing harmony within the group\*
- 15. When team members have diverse thoughts on a project, I can easily empathise with the different points of view
- 20. I offer support and guidance when a team member hits a barrier on a project
- 25. When brainstorming ideas, I am the one that gets the team back on track if the group dynamics are not working\*
- 30. I encourage building and cross-fertilisation of ideas within the team\*
- 35. I ask the right questions needed to get the best out of others
- 40. I am good at getting a diverse set of people to join together around a common goal\*

#### **Personality – Big Five**

Full 44-item version of the tool as published in John & Srivastava (1999). The response scale is a 5-point Likert scale from 'strongly disagree' to 'strongly agree' – all items have the stem '*I see myself as someone who...*'. R denotes a reverse-scored item.

#### **Extraversion**

- 1. Is talkative
- 6R. Is reserved
- 11. Is full of energy
- 16. Generates a lot of enthusiasm
- 21R. Tends to be quiet
- 26. Has an assertive personality
- 31R. Is sometimes shy, inhibited
- 36. Is outgoing, sociable

#### **Agreeableness**

- 2R. Tends to find fault with others
- 7. Is helpful and unselfish with others
- 12R. Starts quarrels with others
- 17. Has a forgiving nature
- 22. Is generally trusting
- 27R. Can be cold and aloof
- 32. Is considerate and kind to almost everyone

- 37R. Is sometimes rude to others
- 42. Likes to cooperate with others

### **Conscientiousness**

- 3. Does a thorough job
- 8R. Can be somewhat careless
- 13. Is a reliable worker
- 18R. Tends to be disorganised
- 23R. Tends to be lazy
- 28. Perseveres until the task is finished
- 33. Does things efficiently
- 38. Makes plans and follows through with them
- 43R. Is easily distracted

### **Neuroticism**

- 4. Is depressed, blue
- 9R. Is relaxed, handles stress well
- 14. Can be tense
- 19. Worries a lot
- 24R. Is emotionally stable, not easily upset
- 29. Can be moody
- 34R. Remains calm in tense situations
- 39. Gets nervous easily

### **Openness**

- 5. Is original, comes up with new ideas
- 10. Is curious about many different things
- 15. Is ingenious, a deep thinker
- 20. Has an active imagination
- 25. Is inventive
- 30. Values artistic, aesthetic experiences
- 35R. Prefers work that is routine
- 40. Likes to reflect, play with ideas
- 41R. Has few artistic interests
- 44. Is sophisticated in art, music or literature

### **Creative/Innovative Performance**

Full 17-item version of the tool listed below used in both Study 1 and Study 2. An asterisk denotes the items that were retained for inclusion in the research as a refined 13-item tool following EFA and CFA processes. Information in parentheses detail the original wording of the item and its source. The response scale is a 5-point Likert scale of 'never', 'rarely', 'sometimes', 'often' and 'always'.

### **Task Presentation**

- I readily see opportunities for improvement\*  
(new item constructed to complement the existing from de Jong & Den Hartog, 2010)
- I prefer to identify how things can be improved\*  
(I wonder how things can be improved – de Jong & Den Hartog)
- I wonder how things can be improved\*  
(unchanged – de Jong & Den Hartog)

### **Preparation**

- I identify the knowledge needed to make a project happen  
(I acquire knowledge about the task at hand– Binnewies et al., 2007)
- I prefer to gather information about the task at hand  
(I gather information about the task at hand – Binnewies et al.)
- I reference past knowledge as a way to add value to current projects  
(new item constructed to complement the existing from Binnewies et al.)

### **Idea Generation**

- I generate novel and innovative solutions to problems\*  
(I generate original solutions to problems – de Jong & Den Hartog)
- I find new approaches to execute tasks\*  
(unchanged – de Jong & Den Hartog)
- I generate original solutions to problems\*  
(unchanged – de Jong & Den Hartog)
- I generate useful and practical solutions to problems  
(I generate original solutions to problems – de Jong & Den Hartog)

### **Idea Validation**

- I carefully balance the options available before deciding on the way forward\*  
(I balanced different options of how to approach the task differently and ultimately – Binnewies et al.)
- I assess the advantages and disadvantages of various ideas\*  
(I thought about all advantages and disadvantages of each alternative approach – Binnewies et al.)
- I prefer to deliberate about which option to pursue\*  
(I intensely deliberated about which option would be the best to implement – Binnewies et al.)

### **Outcome Assessment**

- When making decisions, I consider the various options in the context of a specific goal\*  
(unchanged – Scott & Bruce, 1995)
- I logically determine if a project was a success or not\*  
(new item constructed to complement the existing from Scott & Bruce)
- I systematically determine what the future actions should be\*  
(I make decisions in a logical and systematic way – Scott & Bruce)
- I prefer to make decisions and assessments logically\*  
(I make decisions in a logical and systematic way – Scott & Bruce)

Source references:

Binnewies, C., Ohly, S., & Sonnentag, S. (2007). Taking personal initiative and communicating about ideas: What is important for the creative process and for idea creativity? *European Journal of Work and Organizational Psychology*, 16(4), 432–455. <https://doi.org/10.1080/13594320701514728>



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### **Appendix 3: Measures: Study 2**

Measures used for creative style and creative/innovative performance were the same as Study 1 and can be found in Appendix 3.

#### **Leadership Style – Transformational Leadership Scale**

Full 15-item version of the tool as published in Rafferty & Griffin (2004). All items were retained for inclusion in the research. The response scale is a 5-point Likert scale from 'strongly disagree' to 'strongly agree' – all items have the stem '*Bear in mind your leader...*'. R denotes a reverse-scored item.

##### **Vision**

Has a clear understanding of where we are going

Has a clear sense of where he/she wants our unit to be in 5 years

R - Has no idea where the organisation is going

##### **Inspirational Communication**

Says things that make employees proud to be a part of this organisation

Says positive things about the work unit

Encourages people to see changing environments as situations full of opportunities

##### **Intellectual Stimulation**

Challenges me to think about old problems in new ways

Has ideas that have forced me to rethink some things that I have never questioned before

Has challenges me to rethink some of my basic assumptions about my work

##### **Supportive Leadership**

Considers my personal feelings before acting

Behaves in a manner which is thoughtful of my personal needs

Sees that the interests of employees are given due consideration

##### **Personal Recognition**

Commends me when I do a better than average job

Acknowledges improvement in my quality of work

Personally compliments me when I do outstanding work

## Appendix 4: Ethics documentation

### Study 1: Ethics application form



Application 050254

#### Section A: Applicant details

Date application started:

Tue 25 October 2022 at 15:19

First name:

Lee

Last name:

Rabbetts

Email:

lmrabbetts1@sheffield.ac.uk

Programme name:

PhD

Module name:

PhD

Last updated:

31/01/2023

Department:

Management School

Applying as:

Postgraduate research

Research project title:

Creative style relationship with leadership style and innovative performance

Has your research project undergone academic review, in accordance with the appropriate process?

Yes

Similar applications:

- not entered -

#### Section B: Basic information

Supervisor

Name

Email

Kamaljit Birdi

k.birdi@sheffield.ac.uk

Proposed project duration

Start date (of data collection):

Tue 3 January 2023

Anticipated end date (of project)

Mon 6 November 2023

3: Project code (where applicable)

Project externally funded?

Yes

Project code  
n/a funded by external organisation - Creative Creatures

#### Suitability

Takes place outside UK?

No

Involves NHS?

No

Health and/or social care human-interventional study?

No

ESRC funded?

No

Likely to lead to publication in a peer-reviewed journal?

Yes

Led by another UK institution?

No

Involves human tissue?

No

Clinical trial or a medical device study?

No

Involves social care services provided by a local authority?

No

Is social care research requiring review via the University Research Ethics Procedure

No

Involves adults who lack the capacity to consent?

No

Involves research on groups that are on the Home Office list of 'Proscribed terrorist groups or organisations'?

No

#### Indicators of risk

Involves potentially vulnerable participants?

No

Involves potentially highly sensitive topics?

No

### Section C: Summary of research

#### 1. Aims & Objectives

The aims of the project are to assess a measure of creative style (Creative ID - an online questionnaire based psychometric tool) and to explore the relationship between an individual's creative style and their leadership style – whilst also looking into the effect this has on followers.

Creative style is the preference an individual has in achieving creativity and is a relatively under researched area of work psychology. Currently, the dominant theories of creativity (such as Amabile) focus on identifying the antecedents of creativity, and the outcome levels of creativity. These theories don't currently account for the individual differences that exist in the moment of actually being creative, or the implications of these. Also, despite a number of creative style measures existing, none of them seem to be explicitly grounded in established creativity and innovation theory, or linked to creative output at different stages of the creative process.

Additionally, there are limitations to the existing, dominant measures of creative style (notably Kirton's Adaption-Innovation Inventory) around the factor structure, validity and whether they explain anything beyond the Big Five personality measures alone. It is believed that, with further assessment, the Creative ID tool would be an appropriate,

more in-depth measure of creative style than those currently established in the literature as it has a robust factor structure, can be aligned to existing academic theory and has links to levels of creative performance. Through a deeper understanding of creative style - by establishing a more in-depth, reliable and valid measure of it; and by looking at how it relates to, or correlates with, other better established constructs such as leadership style, this research aims to better define creative style as a construct and potentially make a theoretical contribution in integrating this construct into existing theories of creativity and innovation whilst opening up avenues for suggested future research both in this area and in the area of leadership theory.

There is existing research into links between leadership style and creativity. Though there is currently a gap in the literature around any link between creative style and leadership, or creative style and leadership style. The current research aims to establish whether there is a relationship between creative style and leadership style, as well as exploring what this relationship means for the creative performance of the leader and their followers, and the followers' perception of their leader's performance. As per recent research – namely Sun et al., 2017 and Koh et al., 2019 – additional research has been called for to better understand the potential antecedents of positive leadership styles such as transformational leadership, and for research to provide a greater understanding of the “innovativeness” of leaders. The current research is well placed to both look into potential antecedents of leadership style which have not been explored before (creative style) and to look into the innovativeness of leaders by including measures of performance at various stages of the innovation process. Knowledge of this could make both a theoretical contribution to the creative style and leadership style literature as well as potentially advancing the definition of creative style and leadership style in better understanding their nature and impact as constructs.

## 2. Methodology

The research aims to explore a number of relationships between the following constructs (as well as exploring potential mediating/moderating relationships pending the construction of final research hypotheses):

1. Creative style of an individual and their own innovative performance
2. Leadership style of leader and innovative performance of follower
3. Creative style and leadership style of an individual
4. Creative style of leader and innovative performance of follower
5. Leadership style of leader and their perceived leadership effectiveness (as perceived by follower)
6. Creative style of leader and their perceived leadership effectiveness (as perceived by follower)

There is a single phase of data collection in this research, with all data obtained through online questionnaires. Data will be collected on creative style (CreativeID) and leadership style (Multifactor Leadership Questionnaire (MLQ), Bass & Avolio, 2004). There will be items relating to self-reported creative performance (aligned to the stages of Amabile's individual innovation process) and perceived leadership effectiveness of leader (from MLQ). Data will be analysed at the individual level - looking at correlations between creative style and leadership style, as well as regression analyses and testing for moderation and mediation in exploring how creative style relates to leadership style. Data will also be analysed at a leadership-follower level with respondents matched up with their respective leaders and followers as appropriate (in dyads) to explore whether the leadership style and creative style of leaders are linked to the creative performance of followers, and followers' perceptions of their leaders.

Data is collected in one phase and there are three possible approaches to this data collection. For 'known' contacts, 'unknown' contacts and 'paid' contacts.

### 1. 'Known' contacts

These contacts will be identified and approached by the project's sponsor, Creative Creatures, directly to ensure the research team have no visibility of personal details. These contacts will be known to be in a leadership position.

Each leader will be sent a 'leader focused' questionnaire which includes all of the relevant measures relating to creative style, leadership style, performance etc. as well as an item asking the participant to generate a unique identification code (for example first 3 letters of town/city of birth, day of birth, shoe size). This removes the requirement for the leader to name themselves.

Upon completion of the questionnaire, the leader will be provided with a unique questionnaire link which incorporates their unique ID. This link is generated automatically by the survey software, appearing on one of the final screens before completion. There is no human input in this process.

They will be asked to send this unique link to their followers – this is a 'follower focused' questionnaire that will include all of the 'follower relevant' items, and the nature of the unique code means that any responses can be linked back to the specific leader, without the need for the follower to name themselves or their leader. Confidentiality will be stressed throughout, with participants reassured that nobody outside of Creative Creatures will have access to their responses, and all responses will be anonymised before analysis.

Should the leadership contact have the authority to grant access to the entire organisation, they will be asked to distribute a 'leader focused' questionnaire to all people with leadership/management responsibility in the organisation. This ensures that no contact is made by Creative Creatures or the research team with the wider organisation, and no personal details shared. The fact that the questionnaire has been distributed throughout the organisation by a senior leadership figure should add gravitas to the project and ensure a higher response rate than if it was sent by an 'external' i.e. Creative Creatures. It is recognised that participation rates may be affected due to the extent of the work involved from leaders in not only completing their own questionnaire, but then sending on a link to their followers. Followers may also be cautious (despite reassurances of confidentiality) of completing a leadership questionnaire which has come to them directly from their leader. However, we see these potential participation issues as worthwhile in maintaining the confidentiality required of the research. Should the leadership contact not be able to provide wider access across the organisation, they will simply be

asked to participate as a leader, passing on the questionnaire to their own followers as detailed above. It will be asked that each leader include at least 3 of their followers / direct reports in the research (or all of their followers if they manage 3 or fewer), with these being the ones they have worked with for the longest to provide the leader-follower pairings that likely have most knowledge of each other.

No submitted data will be visible to the participants, their leaders, followers or organisations. Information will be asked in the questionnaire regarding organisation and job role – any information provided here which could potentially identify an individual would be removed by before data analysis. All data will be received by the research team who will match leader and follower responses (through the unique IDs as appropriate).

#### 2. 'Unknown contacts'

Should the required participation rate not be met through 'known' contacts. Further participants will be sought. Recruiting these participants will involve Creative Creatures posting the participation opportunity on LinkedIn where they have a substantial reach and following. Here we would be looking to attract adults currently in employment and in a leadership/management position who have a good enough grasp of the English language to understand the scope of the research. The nature of the creative style and leadership styles tools are relevant to all adult age groups, all sectors of employment, seniority, and all genders, ethnicities etc. providing they are in a position of leading/managing others. There is no need to limit the scope of participation by any other characteristics.

As with the methodology above, each leader responding to this opportunity would be provided with the 'leader focused' questionnaire which involves the creation of a unique ID and the requirement to pass on a questionnaire link to their followers for completion.

#### 3. 'Paid contacts'

The final method of obtaining participants (should this be required) would be to repeat option 2 using the Prolific online platform where participants get paid for completing surveys. In this case their Prolific ID number would be the unique code, and there would be a requirement that we receive 3 follower questionnaires matched to their unique code before full payment was made.

### 3. Personal Safety

Have you completed your departmental risk assessment procedures, if appropriate?

Yes

Raises personal safety issues?

No

There is no travel or exposure to physical risk - all research will be conducted with participants online.

There are no sensitive topics or well-being issues as part of the research which would constitute a risk to the psychological/mental wellbeing of the researchers. It will be made clear to participants what the scope of the research is, and that the lead researcher is not qualified to comment upon or provide guidance in relation to any other matters.

Should any issues still arise during the course of the research it will be made clear to all participants that should they become distressed or uncomfortable at any time, they are free to stop their participation in the research and it is recommended that they contact their GP or other appropriate medical professional to discuss their issue further and obtain appropriate advice and/or treatment. If they feel that their distress or discomfort is as a direct result of the research methods or methodology, the process for complaints and escalation will be made clear to all participants.

## Section D: About the participants

### 1. Potential Participants

New participants can be any adults in employment who have the ability to understand English language questionnaires and either formally lead/manage/supervise somebody "a leader", or are directly led/managed/supervised by somebody else "a follower" with the intention of matching up leader-follower pairings i.e. dyads.

These leaders will be recruited from a number of organisations worldwide – these vary in size from SMEs up to international corporations, as well as being varied in terms of culture and geography.

Leaders are required as the research is concerned with leadership style, creative style, the possible relationship between these and the impact on followers. The research could simply collect data at the leader level – asking them to complete self-report measures of how they perceive themselves, as well as give views of how they believe their followers perform and how their followers perceive them as leaders. However, this research wants to get the additional viewpoint of the followers themselves, to get their own perception of their leaders, as well as how well they think they perform themselves.

Adults have been chosen to avoid any potentially vulnerable child participants; they should be employed as the research focuses predominantly on their preferences at/in work; and the established measures to be used in obtaining data are in the English language and translation risks altering the established reliability.

Assuming a Multilevel Modelling approach due to the dyadic nature of the leader-follower element of this study, an estimated required sample, based on the work of Maas and Hox (2005), would be that the higher level sample (i.e. leaders) shouldn't be significantly below

100. Therefore, the current research will look to obtain >100 leaders as part of the overall sample which is consistent with an estimated sample size >200 (i.e. >100 dyads) being required (Du & Wang, 2016).

## 2. Recruiting Potential Participants

There will be three methods of participant recruitment.

1. 'Known' contacts of Creative Creatures - those in leadership positions who have provided their contact details previously to be contacted again and allow research access. These people who are already 'on file' would be contacted by the Creative Creatures (by email) asking for their participation - this communication would include an information form, consent form and (once consent is obtained by a tick box) access to the questionnaire itself.
2. 'Unknown' participants responding to an 'advert' - a request for participants on more accessible forums such as LinkedIn or online leadership and creativity forums - this will be coordinated by Creative Creatures who have a significant following and reach on such platforms. The 'advert' will be placed in forums focused on those who have an interest in creativity and/or leadership and would therefore have more of an interest in the subject matter (and potentially more motivation to participate and learn from the findings) than the general population.
3. Should the previous two methods combined not provide an adequate sample size, a paid online participant platform (such as Prolific) would be considered. It is possible to obtain leader-follower data from these platforms, though it does entirely rely on the initial participant forwarding the survey on to their respective leader/followers as appropriate. There are certain issues of authenticity here as there is no way of being 100% sure that the participants are who they claim to be, and that their working relationship is as desired. However, certain checks can be put in place, such as the use of organisational email – by asking the initial participant to provide their work email address, and the addresses of their leader/followers, some standard 'validation' checks can be done in the same way a 2-factor authentication log in is used (asking the participant to confirm, through an official organisational email address, that they are the person completing the survey).

The initial information given to all prospective participants will include an overview of the research aims - that it concerns creative style, leadership style and the relationship between leaders and followers. The research will involve the completion of an online questionnaire at a single timepoint. It will be explained that participation is entirely voluntary, participation can be withdrawn at any time, more information can be provided from the research team, that they can have research updates on the findings should they wish and that their information will be treated confidentially and wherever possible anonymised. In return for their participation, they will be invited (should they wish to be) to an optional follow-up webinar where they can find out more about creative styles as well as the dissemination of the research results. Should participants be recruited through a platform such as Prolific, they would be due payment in return for their contribution, such payment would not be offered to other participants. Once this has been explicitly understood and consent given to participate in the research, the questionnaire will become available. It has been decided that all participants be contacted by Creative Creatures for confidentiality reasons - with the raw data coming to the research team for analysis.

My role as researcher in this phase will be to do everything except the initial contact with participants (which will require the use of personal data) i.e. to review the required measures, create each questionnaire, ensure that appropriate levels of information and checking of consent are in place. Furthermore, the leader-follower matching of the raw anonymised data prior to analysis will be the responsibility of the researcher, not Creative Creatures, at this stage.

### 2.1. Advertising methods

Will the study be advertised using the volunteer lists for staff or students maintained by IT Services? No

- *not entered* -

## 3. Consent

Will informed consent be obtained from the participants? (i.e. the proposed process) Yes

The process for obtaining consent would be the same for all participants, regardless of whether they are contacted directly as existing contacts of Creative Creatures, or if they proactively respond to the opportunity through a social media post or through the Prolific platform. The information sheet will be provided at the start of the survey.

Informed consent would be obtained prior to data collection. For example in explaining the purpose of the research: When people research creativity, they usually look at typically 'creative' people and explore how they can be even more creative (i.e. how much creativity can they achieve). This research is looking into something different – we believe that everybody is creative, and we are interested in how... we want to better understand creative styles, this is about how you prefer to be creative. This is an under-researched area in work psychology and we'd like to better measure this using the Creative ID by Creative Creatures – an easy to complete questionnaire which can tell you which of five creative styles (Stimulator, Spotter, Sculptor, Selector, Supporter) best describes your way of working. We're particularly interested in investigating whether creative style is in any way related to leadership style – to better understand how different types of creative people prefer to lead their people – what does these different styles mean for the performance of their followers? Are leaders with a particular creative style seen as more effective by their followers?

Although the information obtained through your participation would be valuable to us, we understand that you may not want to contribute this information. There is no obligation to participate in this area of the research, or in fact any area of the research.

It will be explained that participation is entirely voluntary, participation can be withdrawn at any time (should you wish to withdraw after the submission of your data, please contact the lead researcher within 30 days to remove your information from the analyses), more information can be provided from the research team, that they can have research updates on the findings should they wish and that their information will be treated confidentially and wherever possible anonymised. Participants will be provided with information regarding the full scope of the research.

#### 4. Payment

Will financial/in kind payments be offered to participants? Yes

For the majority of participants, no. There is a contingency plan should there be a poor response rate that participant numbers could be increased through the use of an online platform such as Prolific – this would result in a financial payment in return for participation in the research as per the terms of this well-established academic participant sourcing platform.

#### 5. Potential Harm to Participants

What is the potential for physical and/or psychological harm/distress to the participants?

Very limited impact.

The only content of a potentially sensitive nature in the research is asking participants to name their leader (for the purposes of leader-follower matching) which may provide some level of discomfort for the participant as they will also be rating their leader's effectiveness.

How will this be managed to ensure appropriate protection and well-being of the participants?

Participants will be consistently reassured of confidentiality, also These questions will not be compulsory and participation can be withdrawn at any time.

Should participants become distressed at any stage of their participation, it will be advised that if the participant feels that answering any questions as part of the research draws their attention to problems in their life, and they are worried about the impact of this, we would advise that they consider withdrawing from the research and to contact the appropriate service provided by their employer or their GP to obtain appropriate advice, guidance or treatment.

#### 6. Potential harm to others who may be affected by the research activities

Which other people, if any, may be affected by the research activities, beyond the participants and the research team?

It is not anticipated that anybody beyond the research team and participants would be at risk of any harm. However, it will be made clear to participants what the scope of the research is, and that the lead researcher is not qualified to comment upon or provide guidance in relation to any other matters.

What is the potential for harm to these people?

N/A

How will this be managed to ensure appropriate safeguarding of these people?

Should any unforeseen issues arise during the course of the research, it will be made clear to all participants that should they become distressed or uncomfortable at any time, they are free to stop their participation in the research and it is recommended that they contact their GP or other appropriate medical professional to discuss their issue further and obtain appropriate advice and/or treatment. If they feel that their distress or discomfort is as a direct result of the research methods or methodology, the process for complaints and escalation will be made clear to all participants.

#### 7. Reporting of safeguarding concerns or incidents

What arrangements will be in place for participants, and any other people external to the University who are involved in, or affected by, the research, to enable reporting of incidents or concerns?

There is very low risk of concerns or incidents occurring due to the nature of this research. However, should anybody participating in the research have any concerns, they will firstly be encouraged to directly contact the primary researcher with their concerns. If they feel that this is inappropriate, guide them to contact either a more senior, experienced researcher in the area (one of the project supervisors); or if this is not deemed appropriate, they will be directed to an impartial body not actively involved in the research (Head of Department).

Who will be the Designated Safeguarding Contact(s)?

Lee Rabbetts, the primary researcher

How will reported incidents or concerns be handled and escalated?

Incidents will be handled on a case-by-case basis, with a bespoke and appropriate response to each individual query. Should a query not be able to be handled appropriately by the Designated Safeguarding Contact, it will be escalated to the supervisor(s) of the research, before (if necessary) being escalated to a more senior and independent contact (Head of Department).



Should a query not be successfully addressed through the communication of additional information - i.e. there is a fundamental flaw with the research method that needs to be addressed; the ongoing active data collection will be stopped until a satisfactory solution can be reached.

## Section E: About the data

### 1. Data Processing

Will you be processing (i.e. collecting, recording, storing, or otherwise using) personal data as part of this project? (Personal data is any information relating to an identified or identifiable living person).

Yes

Which organisation(s) will act as Data Controller?

Other

Joint data controller responsibility between the University of Sheffield and Creative Creatures

### 2. Legal basis for processing of personal data

The University considers that for the vast majority of research, 'a task in the public interest' (6(1)(e)) will be the most appropriate legal basis. If, following discussion with the UREC, you wish to use an alternative legal basis, please provide details of the legal basis, and the reasons for applying it, below:

- *not entered* -

Will you be processing (i.e. collecting, recording, storing, or otherwise using) 'Special Category' personal data?

No

### 3. Data Confidentiality

What measures will be put in place to ensure confidentiality of personal data, where appropriate?

Confidentiality will be ensured throughout by the anonymisation of data through the creative of unique IDs during the completion of the questionnaires. Any potentially identifiable information (such as organisation or job role – should these contain personal information) would be deleted by the research team before the data are analysed. Any direct contact made with participants, or potential participants, will only be made by Creative Creatures or by participants themselves (i.e. a leader forwarding a questionnaire to a follower), therefore ensuring that the research team never has access to personal or contact details.

Creative Creatures will have names and email addresses of participants to enable the initial contact of participants, however this information will not be accessible to the research team, and data submitted to the research team via questionnaire will be anonymised with unique IDs. These ID numbers will not be linked to any personally identifiable data such as employee numbers, they will be newly generated for the research. These ID numbers will be used by the research team to match up the leader-follower pairings as outlined in the methodology section of this application.

The anonymous data will be stored securely by the research team in university provided google drive accounts (with restricted access for the research team only) and personal information stored by Creative Creatures in line with their ongoing GDPR responsibilities.

Participants will be offered the opportunity to receive an overview of the outcomes of the research upon completion – this will be disseminated by Creative Creatures (using the participants' contact details) rather than the research team to ensure no personal information is in the possession of the research team. Any results disseminated will be of a general nature and will not highlight specific outliers, anomalies or anything identifiable obtained from the survey.

### 4. Data Storage and Security

In general terms, who will have access to the data generated at each stage of the research, and in what form

All management of data and implementation of the data management plan is the responsibility of the lead researcher, Lee Rabbetts. The data will be stored securely by the research team in university provided google drive accounts (with restricted access for the research team only) and personal information stored by Creative Creatures in line with their ongoing GDPR responsibilities.

Handling raw data from questionnaires, including personal information of the participants, will be handled by Creative Creatures. This data will be anonymised before providing access the wider research team (i.e. lead researcher, Lee Rabbetts and University supervision team) who will then be responsible for all statistical analysis. Creative Creatures will not conduct any statistical analysis or make any inferences based on the data.

As the IPR owner of the data, Creative Creatures will be responsible for the storage of the data beyond the scope of the current research and as such will do so in accordance with GDPR regulations relating to the management of personal

information. Further access to the data beyond the scope of the current research will be at their discretion.

What steps will be taken to ensure the security of data processed during the project, including any identifiable personal data, other than those already described earlier in this form?

No further detail to be added beyond that already stated. A Data Management Plan is attached and data will not be transferred outside of the EEA.

Will all identifiable personal data be destroyed once the project has ended?  
No

Please outline your plans for retention of the data, including a justification for holding personal data beyond the end of the project, and data security arrangements.

Data collected will be owned by, and stored responsibly by, the partner organisation Creative Creatures. Much of the personal data will be from existing contacts and clients of Creative Creatures, who already store their information for as long as is reasonably required in line with GDPR requirements until such a time that their information is no longer required in the course of their normal business.

It is anticipated that these data could form part of a longitudinal research in the future and therefore details (name and email) will need to be kept to enable future contact. All data will be stored securely and responsibly by the data owner, Creative Creatures, in line with GDPR regulations and the standards upheld by the University of Sheffield.

Only anonymised data will be kept by the research team, and only for the duration of the research (i.e. until completion of the PhD); however, this data is owned by Creative Creatures and the data may be useful for future research purposes or an extension of the research – it is agreed that Creative Creatures (who have a longstanding research partnership with the University of Sheffield) will retain the anonymised data until such a time that it is no longer required or relevant to future research / publication.

## Section F: Supporting documentation

### Information & Consent

Participant information sheets relevant to project?  
Yes

[Document 1114692 \(Version 1\)](#)

[All versions](#)

Consent forms relevant to project?  
Yes

[Document 1114693 \(Version 1\)](#)

[All versions](#)

### Additional Documentation

[Document 1114694 \(Version 1\)](#)

[All versions](#)

Data Management Plan

[Document 1114695 \(Version 1\)](#)

[All versions](#)

Consent built in to the start of the online questionnaire (screenshot)

[Document 1114696 \(Version 1\)](#)

[All versions](#)

Measures for inclusion in questionnaire

### External Documentation

- not entered -

## Section G: Declaration

Signed by:  
Lee Rabbetts  
Date signed:  
Tue 24 January 2023 at 16:51

## Participant information sheet

### Measuring creative style and exploring if it changes over time, and why.

You are being invited to take part in a research project. Before you decide whether or not to participate, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. Ask us if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part. Thank you for reading this.

#### Research Purpose

When people research creativity, they usually look at typically 'creative' people and explore how they can be even more creative (i.e. how much creativity can they achieve). This research is looking into something different – we believe that everybody is creative, and we are interested in *how...* we want to better understand creative styles, this is about how you prefer to be creative. This is an under-researched area in work psychology and we'd like to better measure this using the Creative ID by Creative Creatures – an easy to complete questionnaire which can tell you which of five creative styles (Stimulator, Spotter, Sculptor, Selector, Supporter) best describes your way of working. We're particularly interested in ensuring the Creative ID gives consistent results over time, and accurately measures what it is meant to. We're also interested in whether somebody's creative style is likely to change over time (and if it does, could this be because of experiencing certain work-life events). This research is part of a wider project conducted by Lee Rabbetts at the University of Sheffield to achieve his PhD qualification.

#### Why have you chosen me?

You've responded to an opportunity that we have advertised asking for participants in our research. As you have declared an interest in participating, you are an adult and currently in employment, we feel that getting to know more about your creative style, and how it possibly changes over time, would be valuable to this research.

#### Do I have to take part?

It is up to you to decide whether to take part or not. If you do decide to take part, you will be given this information sheet to keep (and be asked to sign a consent form) and you can still withdraw at any time without any negative consequences. You do not have to give a reason. If you wish to withdraw from the research, please contact Lee Rabbetts using [lmrabbetts1@sheffield.ac.uk](mailto:lmrabbetts1@sheffield.ac.uk).

Please note that that by choosing to participate in this research, this will not create a legally binding agreement, nor is it intended to create an employment relationship between you and the University of Sheffield or Creative Creatures.

#### What will happen if I choose to take part?

We will ask you to complete a questionnaire, the link to which is attached as part of this communication. This will take you approximately 20 minutes to complete. This questionnaire will have some demographic questions (about your age, employment status, etc.), some questions about your preferred creative style, your personality, and some questions about whether you have experienced certain work-life events (such as promotions, or parental leave).

We will ask you to complete exactly the same questions again in approximately 6 months from now. It would be greatly appreciated if you were happy to complete the questionnaire at both of these timepoints so we can see how your style has changed over this time period. However, we'll ask you again nearer the time to check if you're still happy to participate.

Finally, you will be given the opportunity to opt-in for a follow up interview. If, after completing the questionnaire at both timepoints, you have a really interesting change in your creative style, it would be great to discuss this in greater detail with you on a video call (for approximately 30 minutes) with the main researcher, Lee Rabbetts. As with all stages of this research, there is no obligation to opt-in for a potential interview and we'll check whether you'd like to participate in this element after you complete the second questionnaire.

#### What are the benefits and risks of taking part?

Having been approved by the University of Sheffield's ethics committee, we don't anticipate any risks in participating in this research.

However, there are benefits! Firstly, you will be helping Lee to achieve his PhD.

But more importantly, we recognise that you are contributing your valuable time to this research and in return we will provide you with a copy of your Creative ID which will give you insight in to how you prefer to be creative in the workplace. Furthermore, you will be invited to a complimentary webinar where the research findings will be presented and you'll gain further information on how you can make the most of your Creative ID in the workplace.

#### Will my participation be kept confidential?

All the information that we collect about you during the course of the research will be kept strictly confidential and will only be accessible to members of the research team. You will not be able to be identified in any reports or publications unless you have given your explicit consent for this. Should you choose to participate in a follow up interview via video call, the audio and/or video recordings of your activities made during this research will be used only for analysis. No other use will be made of them without your written permission, and no one outside the project will be allowed access to the original recordings.

#### What is the legal basis for processing my personal data?

According to data protection legislation, we are required to inform you that the legal basis we are applying in order to process your personal data is that 'processing is necessary for the performance of a task carried out in the public interest' (Article 6(1)(e)). Further information can be found in the University's Privacy Notice <https://www.sheffield.ac.uk/govern/data-protection/privacy/general>

#### **What will happen to the data collected, and the results of the research project?**

The data collected will be anonymised before any analysis is conducted – the results of this project are likely to be complete by October 2023 and will be made available to all who have participated in the research. No personal information of identifiable information will be included in any results or publications.

All data will be stored securely by the University of Sheffield and Creative Creatures as joint data controllers in line with GDPR regulations throughout the project. At the end of the project Creative Creatures will continue to securely store the data. Due to the nature of this research, it is very likely that other researchers may find the data collected to be useful in answering future research questions, as such we cannot give a definite date for deletion of the data collected. We will ask for your explicit consent for your data to be shared in this way.

#### **Who is organising and funding the research?**

Creative Creatures are funding this research in its entirety.

#### **Who is the Data Controller?**

The University of Sheffield and Creative Creatures will act as joint Data Controllers for this study. This means that they are responsible for looking after your information and using it properly. Creative Creatures will become the sole Data Controller after the research is complete.

#### **Who has ethically reviewed the project?**

This project has been ethically approved via the University of Sheffield's Ethics Review Procedure, as administered by the Institute of Work Psychology / Management School.

#### **What if something goes wrong and I wish to complain about the research or report a concern or incident?**

If you are dissatisfied with any aspect of the research and wish to make a complaint, please contact Lee Rabbetts ([lmrabbetts1@sheffield.ac.uk](mailto:lmrabbetts1@sheffield.ac.uk)) in the first instance. If you feel your complaint has not been handled in a satisfactory way you can contact the Interim Head of the Department of Work Psychology, Prof. Jeremy Dawson ([j.f.dawson@sheffield.ac.uk](mailto:j.f.dawson@sheffield.ac.uk)). If the complaint relates to how your personal data has been handled, you can find information about how to raise a complaint in the University's Privacy Notice: <https://www.sheffield.ac.uk/govern/data-protection/privacy/general>.

If you wish to make a report of a concern or incident relating to potential exploitation, abuse or harm resulting from your involvement in this project, please contact the project's Designated Safeguarding Contact contact Lee Rabbetts ([lmrabbetts1@sheffield.ac.uk](mailto:lmrabbetts1@sheffield.ac.uk)). If the concern or incident relates to the Designated Safeguarding Contact, or if you feel a report you have made to this Contact has not been handled in a satisfactory way, please contact the Interim Head of the Department of Work Psychology, Prof. Jeremy Dawson ([j.f.dawson@sheffield.ac.uk](mailto:j.f.dawson@sheffield.ac.uk)) and/or the University's Research Ethics & Integrity Manager, Lindsay Unwin ([l.v.unwin@sheffield.ac.uk](mailto:l.v.unwin@sheffield.ac.uk)).

The scope of the research concerns creative style and creativity in the workplace. The research team are not qualified to discuss or provide guidance on issues of a sensitive nature or other topics. Should any issues arise during the course of the research, or should you become distressed or uncomfortable at any time, you are free to stop your participation in the research and it is recommended that you contact their GP or other appropriate medical professional to discuss your issue further and obtain appropriate advice and/or treatment. Furthermore, if you feel that your distress or discomfort is as a direct result of the research methods or methodology, please follow the process for complaints and escalation above. This process should also be followed should you be aware of others (beyond yourself) becoming distressed or uncomfortable in any way as a result of the research. Participation can be stopped at any time, guidance should be sought from an appropriate professional, and processes for complaints followed.

#### **Contact for further information**

If you have any further queries about the research at all, please feel free to contact:

- Primary researcher: Lee Rabbetts ([lmrabbetts1@sheffield.ac.uk](mailto:lmrabbetts1@sheffield.ac.uk)) : 07706 163160)
- Research supervisor: Kamal Birdi ([k.birdi@sheffield.ac.uk](mailto:k.birdi@sheffield.ac.uk))

**Thank you for your time and effort in participating in this research, it is greatly appreciated and unbelievably valuable to Lee, Creative Creatures and people of all creative styles.**

## Participant consent form



### Measuring creative style, exploring if it changes over time, and why. Consent Form for Questionnaire Participation

#### Taking Part in the Project

- I have read and understood the project information sheet, or the project has been fully explained to me. (If you will answer No to this question, please do not proceed with this consent form until you are fully aware of what your participation in the project will mean.)
- I have been given the opportunity to ask questions about the project.
- I agree to take part in the project. I understand that taking part in the project will include participating in two questionnaires (one now and one in approximately 6 months from now) and I will be given the opportunity to opt-in to a follow-up interview following the completion of the second questionnaire.
- I understand that by choosing to participate as a volunteer in this research, this does not create a legally binding agreement nor is it intended to create an employment relationship with the University of Sheffield.
- I understand that my taking part is voluntary and that I can withdraw from the study at any time; I do not have to give any reasons for why I no longer want to take part and there will be no adverse consequences if I choose to withdraw.

#### How my information will be used during and after the project

- I understand my personal details such as name, phone number, address and email address etc. will not be revealed to people outside the project.
- I understand and agree that my words may be quoted in publications, reports, web pages, and other research outputs. I understand that I will not be named in these outputs unless I specifically request this.
- I understand and agree that other authorised researchers will have access to this data only if they agree to preserve the confidentiality of the information as requested in this form.
- I understand and agree that other authorised researchers may use my data in publications, reports, web pages, and other research outputs, only if they agree to preserve the confidentiality of the information as requested in this form.
- I give permission for the data that I provide to be retained and stored responsibly by Creative Creatures so it can be used for future research and learning

#### So that the information you provide can be used legally by the researchers

- I agree to assign the copyright I hold in any materials generated as part of this project to The University of Sheffield and Creative Creatures.

#### Project contact details for further information:

If you have any further queries about the research at all, please feel free to contact:

- Primary researcher: Lee Rabbetts ([lmrabbetts1@sheffield.ac.uk](mailto:lmrabbetts1@sheffield.ac.uk) : 07706 163160)
- Research supervisor: Kamal Birdi ([k.birdi@sheffield.ac.uk](mailto:k.birdi@sheffield.ac.uk))

If you are dissatisfied with any aspect of the research and wish to make a complaint, please contact Lee Rabbetts ([lmrabbetts1@sheffield.ac.uk](mailto:lmrabbetts1@sheffield.ac.uk)) in the first instance. If you feel your complaint has not been handled in a satisfactory way you can contact the Interim Head of the Department of Work Psychology, Prof. Jeremy Dawson ([j.f.dawson@sheffield.ac.uk](mailto:j.f.dawson@sheffield.ac.uk)). If the complaint relates to how your personal data has been handled, you can find information about how to raise a complaint in the University's Privacy Notice: <https://www.sheffield.ac.uk/govern/data-protection/privacy/general>.

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## Ethics approval letter



Downloaded: 27/06/2024  
Approved: 31/01/2023

Lee Rabbetts  
Registration number: 200238162  
Management School  
Programme: PhD

Dear Lee

**PROJECT TITLE:** Creative style relationship with leadership style and innovative performance  
**APPLICATION:** Reference Number 050254

On behalf of the University ethics reviewers who reviewed your project, I am pleased to inform you that on 31/01/2023 the above-named project was **approved** on ethics grounds, on the basis that you will adhere to the following documentation that you submitted for ethics review:

- University research ethics application form 050254 (form submission date: 24/01/2023); (expected project end date: 06/11/2023).
- Participant information sheet 1114692 version 1 (30/11/2022).
- Participant consent form 1114693 version 1 (30/11/2022).

If during the course of the project you need to [deviate significantly from the above-approved documentation](#) please inform me since written approval will be required.

Your responsibilities in delivering this research project are set out at the end of this letter.

Yours sincerely

Sophie May  
Ethics Admin  
Management School

Please note the following responsibilities of the researcher in delivering the research project:

- The project must abide by the University's Research Ethics Policy: <https://www.sheffield.ac.uk/research-services/ethics-integrity/policy>
- The project must abide by the University's Good Research & Innovation Practices Policy: [https://www.sheffield.ac.uk/polopoly\\_fs/1.671066!/file/GRIPPolicy.pdf](https://www.sheffield.ac.uk/polopoly_fs/1.671066!/file/GRIPPolicy.pdf)
- The researcher must inform their supervisor (in the case of a student) or Ethics Admin (in the case of a member of staff) of any significant changes to the project or the approved documentation.
- The researcher must comply with the requirements of the law and relevant guidelines relating to security and confidentiality of personal data.
- The researcher is responsible for effectively managing the data collected both during and after the end of the project in line with best practice, and any relevant legislative, regulatory or contractual requirements.

## Study 2: Ethics application form



Application 044356

### Section A: Applicant details

Date application started:  
Fri 26 November 2021 at 11:37

First name:  
Lee

Last name:  
Rabbetts

Email:  
lrrabbetts1@sheffield.ac.uk

Programme name:  
PhD

Module name:  
PhD  
Last updated:  
21/06/2022

Department:  
Management School

Applying as:  
Postgraduate research

Research project title:  
Creative style: Measurement, state/trait nature and relationship with leadership style.

Has your research project undergone academic review, in accordance with the appropriate process?  
Yes

Similar applications:  
- not entered -

### Section B: Basic information

Supervisor

Name

Email

Kamaljit Birdi

k.birdi@sheffield.ac.uk

Proposed project duration

Start date (of data collection):  
Fri 24 June 2022

Anticipated end date (of project)  
Wed 25 October 2023

3: Project code (where applicable)

Project externally funded?  
Yes

Project code  
n/a

#### Suitability

Takes place outside UK?

No

Involves NHS?

No

Health and/or social care human-interventional study?

No

ESRC funded?

No

Likely to lead to publication in a peer-reviewed journal?

Yes

Led by another UK institution?

No

Involves human tissue?

No

Clinical trial or a medical device study?

No

Involves social care services provided by a local authority?

No

Is social care research requiring review via the University Research Ethics Procedure

No

Involves adults who lack the capacity to consent?

No

Involves research on groups that are on the Home Office list of 'Proscribed terrorist groups or organisations'?

No

#### Indicators of risk

Involves potentially vulnerable participants?

No

Involves potentially highly sensitive topics?

No

### Section C: Summary of research

#### 1. Aims & Objectives

The aims of the project are to assess a measure of creative style (Creative ID - an online questionnaire based psychometric tool) and to explore the nature of an individual's preferred creative style over time (i.e. if it changes over time and if so, why). Creative style is the preference an individual has in achieving creativity and is a relatively under-researched area of work psychology. Currently, the dominant theories of creativity (such as Amabile) focus on identifying the antecedents of creativity, and the outcome levels of creativity. These theories don't currently account for the individual differences that exist in the moment of actually being creative, or the implications of these. Also, despite a number of creative style measures existing, none of them seem to be explicitly grounded in established creativity and innovation theory, or linked to creative output.

Additionally, there are limitations to the existing, dominant measures of creative style (notably Kirton's Adaption-Innovation Inventory) around the factor structure, validity and whether they explain anything beyond the Big Five personality measures alone. It is believed that, with further assessment, the Creative ID tool would be an appropriate, more in-depth measure of creative style than those currently established in the literature as it has a robust factor structure, can be aligned to existing academic theory and has links to levels of



creative performance. Through a deeper understanding of creative style - by establishing a more in-depth, reliable and valid measure of it; and by looking longitudinally to better understand whether it changes over time (i.e. is it more state-like or trait-like), this research aims to better define creative style as a construct and potentially make a theoretical contribution in integrating this construct into existing theories of creativity and innovation whilst opening up avenues for suggested future research in this area.

## 2. Methodology

The research aims to assess the Creative ID tool, before using both longitudinal quantitative, and also qualitative methods, to explore the extent to which creative style is more trait-like or state-like over time. There are four distinct phases to this study.

The first assessed the Creative ID tool (a 40 item measure of creative style which provides participants with a preference score across five distinct styles) in terms of inter-item reliability and factor structure, through the analysis of existing data using exploratory and confirmatory factor analysis techniques. The validation of the tool will use data collected from 2010 to date. With further validation done using the new collected throughout the course of the research (phases two and three below). To clarify, validation at the start of the research using existing data, and further validation at the end of Study 1 once a substantial sample size has been collected. Over 400 should be an adequate sample based on Comrey and Lee's (1992) guidance and as a rule of thumb, a minimum of 10 observations per variable is deemed necessary – the Creative ID has 40 items, hence the target of >400 participants. All historical data are from my project's sponsoring organisation (Creative Creatures).

A small percentage of the data were collected as part of three University of Sheffield MSc projects with Creative Creatures, (one conducted by the current lead researcher, Lee Rabbetts, and all three supervised by Kamal Birdi, also involved in the current research in a supervisory capacity) which received the required University ethical sign off at the time. The remainder of the data were collected independently by Creative Creatures in the course of their business, following the previous standards outlined by the University, including a consent statement referencing the use of data for research purposes.

In the second phase, online questionnaires will be sent to the participants responsible for providing the historical data used in phase one. The Creative ID will be assessed in terms of construct validity by collecting online questionnaire responses of the Creative ID alongside an alternative, established measure of creative style (Kirtton's Adaption-Innovation Inventory, 1999) and an established measure of personality (Big Five, Costa & McCrae, 1992). Finally, the Creative ID tool will be assessed in terms of criterion validity by including both subjective (from Binnewies et al., 2007; de Jong & den Hartog, 2010) and objective measures of creative performance (adapted from Becker, 2009; Birdi et al., 2016) in the data collection and using multiple regression to explore whether the Creative ID explains variance in creative performance after controlling for personality measures. This collected data will provide a further opportunity to conduct the reliability analyses at an additional timepoint using new data. Should the response rate from this participant sample not be adequate, contingency plans for the recruitment of additional participants are in place and are discussed in greater detail in Section D (About the participants). Due to the longitudinal nature of the research, it would be beneficial to contact participants would have already completed the creative style questionnaire in the past – as these people already have a 'data point' – there are approximately 3,000 of these potential participants which can be contacted by Creative Creatures and offered the opportunity to participate in the current research. Analyses will be conducted on this data to determine construct validity of the creative style tools in relation to the personality tool, as well as the use of regression analyses to explore whether measures of creative style are able account for more variance than the big five personality measures alone in respect to individual creative performance. Assuming a small effect size (0.03) and a power of 80%, the required sample size for this population is estimated to be at least 434 participants.

In terms of participant recruitment, Plan A would be to obtain enough respondents from the sample of 3,000 potential participants to progress through the longitudinal study with them alone. However, following the 3,000 potential participants being contacted by email and (if appropriate) sent a reminder email inviting their participation over a 3 week period, the response rate will be assessed.

If the participation rate is lower than required for the validation analyses, Plan B in terms of attracting participants is for Creative Creatures to post the participation opportunity on LinkedIn where they have a substantial reach and following. Here we would be looking to attract adults currently in employment who have a good enough grasp of the English language to understand the tool and the scope of the research. The nature of the creative style tool is such (similar to personality measures) that it is relevant to all adult age groups, all sectors of employment, all roles and levels of seniority, and all genders, ethnicities etc. There is no need to limit the scope of participation by any of these characteristics.

Finally, if Plan B doesn't attract enough participants, Plan C would be to explore a paid online platform (Prolific) for attracting participants. Again these participants would need to be adults in employment with the required level of English language understanding.

In the third phase of the research, a further online questionnaire will be sent to the participants from phase two. This data is collected in the form of online questionnaires measuring creative style (Creative ID) as well as items relating to work-life events to explore whether these events correlate with a change in creative style over time. The work-life event items will be adapted from Kandler et al's (2012) list of items, where participants are asked to select from a list all of the events which they have experienced since the previous data collection point. All work-life events assessed are listed in the later document outlining the measures for use in the research. These include: promotion to a leadership position, experience of creativity training, experience of redundancy, more than 3 months of (involuntary) unemployment, changing to a new workplace (i.e. organisation), changing work location (i.e. a new country/city), retirement, experience of parental leave (maternity/paternity/adoption etc.). This will be assessed when a participant contributes data for the second time to ascertain whether experience of these events correlates with an observed change in creative style over the two timepoints. In terms of analysing the data - a measurement of invariance analysis will be used to check whether any changes in creative style seen over time are likely to be relevant, or that the results are skewed by the tool becoming unreliable over time. Following this, data will be analysed using latent state/trait modelling to explore changes in creative style over time; as well as regression analyses to explore factors which account

for the variance observed. In instances of most significant change in creative style over time, participants will have the opportunity to volunteer for a follow up interview. Participants will be provided information about the entire research project (including the option to volunteer for interview) at the start of the research. Following completion of the survey for a second time, participants will then be reminded that the final element to the research is an optional interview for participants who have demonstrated a significant change in their creative style over time - they will have the opportunity to volunteer (opt-in) at the end of the second survey.

The fourth and final phase of the research is a semi-structured interview for the participants who have both volunteered for this phase of the research and also displayed the most significant changes in creative style over time. It is anticipated that ten interviews will be conducted, to ask about the significant work-life experiences they stated in the quantitative data, as well as an open format for them to contribute any further perceived possible explanation for their change in creative style over time. Interviews would follow a semi-structured interview schedule (as per the document provided) and would be 30 minutes long. Should the participant wish to extend the length of the interview, that would be acceptable, however, no participant would be expected to contribute more than 30 minutes of their time.

Interviews will take place remotely and be conducted preferable via video call using Google Meet or Zoom. However, at the participant's request, should they not consent to being on camera, a phone call would be used as an alternative method. At the point of volunteering for the interview element of the research, participants will also be asked to consent to the recording of their interview – for those giving this consent, interviews conducted via Google Meet / Zoom this would result in the entire interview (both audio and visual) being recorded. In the case of a phone interview, this would mean recording of the audio using the in-built recording function of a smart phone. For each method of conducting interviews, on completion of the interview, the recording will be transferred to the lead researcher's laptop for storage in the approved data repositories and deleted from the original recording device.

For participants who volunteer for interview but do not consent to recording, anonymised notes will be made by the lead researcher throughout the interview to ensure that key themes are captured. Once typed up and saved in the appropriate data repository, these notes would be destroyed.

Interviewees will be contacted by Creative Creatures via email following the completion of the second survey where they have confirmed their interest in participating in the interview element of the research. This email will again provide the relevant information sheet and provide a calendar booking system for the interviewee to select their interview timeslot. The number of interviews conducted will depend on the findings of the quantitative data analyses and how many people's creative style has been seen to change over time. The current aim is to conduct 10 interviews of 30 minutes each to complement the quantitative data – it is anticipated that this will provide enough data for a thematic analysis, whilst being manageable in terms of time and resource required in the research timeline.

At the start of each interview, participants would be reminded of the choices made regarding consent to record, it will be made clear that they are free to change their mind at any time, or stop their participation entirely at any time with no fear of consequence. The interviews would (ideally, consent dependent) be recorded and transcribed, with this qualitative data analysed with thematic analysis techniques to codify respondent themes; categorising and subcategorising through a template analysis process with the aim of producing an outcome report summarising the common themes (and sub-themes) to complement the quantitative insights.

The qualitative data obtained from the interviews will be used to support the quantitative analyses of the questionnaire data. Specifically, the research question is looking into firstly whether an individual's creative style changes over time, and secondly if it does, which work-life events could have contributed to such a change. In using only quantitative data, we may find that the experience of certain events correlate with a particular change of creative style – however, this won't be able to explain why the observed change has occurred. Although causation will also not be determined through interview data, it will provide the participants who have experienced the most change in their creative style to provide their account of why this may be (particularly in relation to the work-life events). It is hoped that the extra depth and perspective provided by the qualitative data could guide future research in terms of better understanding contexts or drivers behind a change in creative style.

### 3. Personal Safety

Have you completed your departmental risk assessment procedures, if appropriate?

Not Applicable

Raises personal safety issues?

No

There is no travel or exposure to physical risk - all research will be conducted with participants online.

There are no sensitive topics or well-being issues as part of the research which would constitute a risk to the psychological/mental wellbeing of the researchers. It will be made clear to participants what the scope of the research is, and that the lead researcher is not qualified to comment upon or provide guidance in relation to any other matters.

Should any issues still arise during the course of the interviews (or indeed the surveys), it will be made clear to all participants that should they become distressed or uncomfortable at any time, they are free to stop their participation in the research and it is recommended that they contact their GP or other appropriate medical professional to discuss their issue further and obtain appropriate advice and/or treatment. If they feel that their distress or discomfort is as a direct result of the research methods or methodology, the process for complaints and escalation will be made clear to all participants.

## Section D: About the participants

## 1. Potential Participants

Some participants have already provided data to the partnering organisation (Creative Creatures) in the past and they will be invited to participate again with the aim of obtaining longitudinal data.

New participants can be any adults in employment who have the ability to understand English language questionnaires. Adults have been chosen to avoid any potentially vulnerable child participants; they should be employed as the research focuses predominantly on their preferences at/in work; and the established measures to be used in obtaining data are in the English language and translation risks altering the established reliability.

Phase one of the research will utilise the existing historical Creative ID data provided by Creative Creatures for the purpose of assessing the reliability of the Creative ID tool (N=3,000). These analyses will also be repeated using new data obtained through this research (required sample size >400)

Phase two of the research (the first questionnaire) will obtain data by following up with the participants who contributed to the existing historical data. These participants will provide data on the Creative ID, an alternative measure of creative style, personality, and performance to assess the validity of the Creative ID (required sample size of 434). Should the required sample size not be achieved, further recruitment through LinkedIn and/or Prolific would commence.

Phase three of the research (the second questionnaire) will obtain data by following up with the participants who contributed to phase two. These participants will provide data on the Creative ID, and experienced work-life events to assess the change in creative style over time, and possible factors contributing to such a change (required sample size of 300).

Phase four of the research will obtain qualitative data through interviews with those participants seen to have the most extreme changes in creative style over time (desired sample size of 10).

## 2. Recruiting Potential Participants

There will be three methods of participant recruitment.

1. Existing contacts of Creative Creatures - those who have contributed data in the past and have provided contact details to be recontacted. These people who are already 'on file' would be contacted by the Creative Creatures (by email) asking for their participation - this communication would include an information form, consent form and (once consent is obtained by a tick box) access to the questionnaire itself.
2. Participants responding to an 'advert' - a request for participants on more accessible forums such as LinkedIn - again, this will be coordinated by Creative Creatures who have a significant following and reach on the platform.
3. Should the previous three methods combined not provide an adequate sample size, a paid online participant platform (such as Prolific) would be considered.

The initial information given to all prospective participants will include an overview of the research aims - that it concerns creative style and how this potentially changes over time. The research will involve the completion of an online questionnaire and it would be greatly appreciated if participants would be willing to be recontacted at future timepoints to complete an additional questionnaire / volunteer for a short online interview. It will be explained that participation is entirely voluntary, participation can be withdrawn at any time, more information can be provided from the research team, that they can have research updates on the findings should they wish and that their information will be treated confidentially and wherever possible anonymised. In return for their participation, participants will be provided with a copy of their Creative ID report giving them information on their creative style. Furthermore, they will be invited to an optional follow-up webinar where they can find out more about creative styles as well as the dissemination of the research results. Should participants be recruited through a platform such as Prolific, they would be due payment in return for their contribution, such payment would not be offered to other participants. Once this has been explicitly understood and consent given to participate in the research, the questionnaire will become available.

It has been decided that all participants be contacted by Creative Creatures for confidentiality reasons - with Creative Creatures making initial contact and collecting the raw data, this makes it possible for the data to be anonymised before it is passed on to the research team for analysis.

### 2.1. Advertising methods

Will the study be advertised using the volunteer lists for staff or students maintained by IT Services? No

- not entered -

## 3. Consent

Will informed consent be obtained from the participants? (i.e. the proposed process) Yes

The process for obtaining consent would be the same for all participants, regardless of whether they are contacted directly as existing contacts of Creative Creatures, or if they proactively respond to the opportunity through a social media post or through the Prolific platform. There will be a separate consent form provided at the appropriate time for the quantitative and qualitative elements of the research. The quantitative information sheet will be provided at the start of both survey 1 and 2. The qualitative information sheet will be provided at the end of survey 2 when the participants have the opportunity to volunteer for this element of the research.

Informed consent would be obtained prior to data collection. For example: the purpose of the research is gain a greater understanding into creative style - the way people prefer to be creative. This research is particularly interested in how creative style relates to other constructs such as personality and also performance; and looking in to how creative style changes over time, if at all, and why. As part of exploring why creative style changes over time, we'd like to ask you about any work-life events you have experienced, just in case these could have contributed to the change. Although this information would be valuable to us, we understand that you may not want to contribute this information. There is no obligation to participate in this area of the research, or in fact any area of the research.

It will be explained that participation is entirely voluntary, participation can be withdrawn at any time, more information can be provided from the research team, that they can have research updates on the findings should they wish and that their information will be treated confidentially and wherever possible anonymised. Participants will be provided with information regarding the full scope of the research i.e. that they can participate in one questionnaire immediately, a follow-up questionnaire in six months, and that they can volunteer for a 30 minute interview after the second questionnaire. There will be an opportunity at the end of each phase of research to volunteer to be included in the next phase, with consent will be obtained at the start of each element of the research before proceeding.

#### 4. Payment

Will financial/in kind payments be offered to participants? Yes

For the majority of participants, no. There is a contingency plan should there be a poor response rate that participant numbers could be increased through the use of an online platform such as Prolific – this would result in a financial payment in return for participation in the research as per the terms of this well-established academic participant sourcing platform.

#### 5. Potential Harm to Participants

What is the potential for physical and/or psychological harm/distress to the participants?

Very limited impact.

The only content of a potentially sensitive nature in the research is part of the longitudinal study looking at whether creative style changes over time. Here participants will be asked whether they have experienced any work-life events between their participation timepoints - work-life both positive or negative and it is acknowledged that asking about potentially negative, work-life events (such as redundancy) may provide some level of discomfort for the participant.

How will this be managed to ensure appropriate protection and well-being of the participants?

Beyond selecting from a list of work-life events, no further detail will be asked of the participants. These questions will not be compulsory and participation can be withdrawn at any time.

It will be made clear that should the participant volunteer for a follow-up interview, that they do not need to discuss their life experiences in that forum should they not wish to, and this decision would not rule them out of the opportunity to participate in that stage of the data collection.

Should participants become distressed at any stage of their participation, it will be advised that if the participant feels that answering any questions as part of the research draws their attention to problems in their life, and they are worried about the impact of this, we would advise that they consider withdrawing from the research and to contact their GP to obtain appropriate advice, guidance or treatment.

#### 6. Potential harm to others who may be affected by the research activities

Which other people, if any, may be affected by the research activities, beyond the participants and the research team?

It is not anticipated that anybody beyond the research team and participants would be at risk of any harm. However, it will be made clear to participants what the scope of the research is, and that the lead researcher is not qualified to comment upon or provide guidance in relation to any other matters.

What is the potential for harm to these people?

N/A

How will this be managed to ensure appropriate safeguarding of these people?

Should any unforeseen issues arise during the course of the interviews (or indeed the surveys), it will be made clear to all participants that should they become distressed or uncomfortable at any time, they are free to stop their participation in the research and it is recommended that they contact their GP or other appropriate medical professional to discuss their issue further and obtain appropriate advice and/or treatment. If they feel that their distress or discomfort is as a direct result of the research methods or methodology, the process for complaints and escalation will be made clear to all participants.

#### 7. Reporting of safeguarding concerns or incidents

What arrangements will be in place for participants, and any other people external to the University who are involved in, or affected by, the research, to enable reporting of incidents or concerns?

There is very low risk of concerns or incidents occurring due to the nature of this research. However, should anybody participating in the

research have any concerns, they will firstly be encouraged to directly contact the primary researcher with their concerns. If should they feel that this is inappropriate, guide them to contact either a more senior, experienced researcher in the area (one of the project supervisors); or if this is not deemed appropriate, they can be directed to an impartial body not actively involved in the research (Head of Department).

Who will be the Designated Safeguarding Contact(s)?

Lee Rabbetts, the primary researcher

How will reported incidents or concerns be handled and escalated?

Incidents will be handled on a case-by-case basis, with a bespoke and appropriate response to each individual query. Should a query not be able to be handled appropriately by the Designated Safeguarding Contact, it will be escalated to the supervisor(s) of the research, before (if necessary) being escalated to a more senior and independent contact (Head of Department).

Should a query not be successfully addressed through the communication of additional information - i.e. there is a fundamental flaw with the research method that needs to be addressed; the ongoing active data collection will be stopped until a satisfactory solution can be reached.

## Section E: About the data

### 1. Data Processing

Will you be processing (i.e. collecting, recording, storing, or otherwise using) personal data as part of this project? (Personal data is any information relating to an identified or identifiable living person).

Yes

Which organisation(s) will act as Data Controller?

Other

Joint data controller responsibility between the University of Sheffield and Creative Creatures.

### 2. Legal basis for processing of personal data

The University considers that for the vast majority of research, 'a task in the public interest' (6(1)(e)) will be the most appropriate legal basis. If, following discussion with the UREC, you wish to use an alternative legal basis, please provide details of the legal basis, and the reasons for applying it, below:

- *not entered* -

Will you be processing (i.e. collecting, recording, storing, or otherwise using) 'Special Category' personal data?

No

### 3. Data Confidentiality

What measures will be put in place to ensure confidentiality of personal data, where appropriate?

Confidentiality will be ensured throughout by the anonymisation of data at source (as collected by Creative Creatures) before the data are then passed on to the research team with no personal or identifiable information included.

In the longitudinal element of the research Creative Creatures will have names and email addresses of participants to enable contact and collection of data over time.

However, they will anonymise this data (deleting personal information and using unique participant ID numbers) before passing it on to the research team. These ID numbers will not be linked to any personally identifiable data such as employee numbers, they will be newly generated for the research. The data will be stored securely by the research team in university provided google drive accounts (with restricted access for the research team only) and personal information stored by Creative Creatures in line with their ongoing GDPR responsibilities.

Participants will be offered the opportunity to receive an overview of the outcomes of the research upon completion – this will be disseminated by Creative Creatures (using the participants' contact details) rather than the research team to ensure no personal information is in the possession of the research team. Any results disseminated will be of a general nature and will not highlight specific outliers, anomalies or anything identifiable obtained from interviews.

### 4. Data Storage and Security

In general terms, who will have access to the data generated at each stage of the research, and in what form

All management of data and implementation of the data management plan is the responsibility of the lead researcher, Lee Rabbetts. The data will be stored securely by the research team in university provided google drive accounts (with restricted access for the research

team only) and personal information stored by Creative Creatures in line with their ongoing GDPR responsibilities.

Handling raw data from questionnaires, including personal information of the participants, will be handled by Creative Creatures. This data will be anonymised before providing access the wider research team (i.e. lead researcher, Lee Rabbetts and University supervision team) who will then be responsible for all statistical analysis. Creative Creatures will not conduct any statistical analysis of make any inferences based on the data.

As the IPR owner of the data, Creative Creatures will be responsible for the storage of the data beyond the scope of the current research and as such will do so in accordance with GDPR regulations relating to the management of personal information. Further access to the data beyond the scope of the current research will be at their discretion.

What steps will be taken to ensure the security of data processed during the project, including any identifiable personal data, other than those already described earlier in this form?

No further detail to be added beyond that already stated. A Data Management Plan is attached and data will not be transferred outside of the EEA.

Will all identifiable personal data be destroyed once the project has ended?

No

Please outline your plans for retention of the data, including a justification for holding personal data beyond the end of the project, and data security arrangements.

Data collected will be owned by, and stored responsibly by, the partner organisation Creative Creatures. Much of the personal data will be from existing contacts and clients of Creative Creatures, who already store their information for as long as is reasonably required in line with GDPR requirements. The research involves a longitudinal element where personal information is required for follow-up data collection at future dates. It is anticipated that this longitudinal element could extend beyond the current research scope and therefore details (name and email) will need to be kept to enable future contact. All data will be stored securely and responsibly by the data owner, Creative Creatures, in line with GDPR regulations and the standards upheld by the University of Sheffield.

Creative Creatures (who will be contacting the participants, rather than the research team undertaking this responsibility) will be anonymising the quantitative data prior to passing this on to the research team for analysis. The personal information involved is already in the possession of Creative Creatures as these participants are their existing clients, and as such, their information will be retained by them until such a time that their information is no longer required in the course of their normal business. Anonymised data will be kept by the research team only for the duration of the research (i.e. until completion of the PhD); however, this data is owned by Creative Creatures and the data may be useful for future research purposes or an extension of the current longitudinal research, therefore Creative Creatures will retain the anonymised data until such a time that it is no longer required or relevant to future research.

In the case of the qualitative data obtained through interviews – personal data will inevitably be available to the research team here (such as contact details to conduct an interview) and will be deleted immediately following the completion of the interview. Any recordings made of interviews only be kept so long as it takes to anonymise and transcribe the information. As per the quantitative data, anonymised qualitative data will be kept by the research team until the completion of the research, with the data then being owned by Creative Creatures and securely stored until such a time that it is no longer required or relevant to future research.

## Section F: Supporting documentation

### Information & Consent

Participant information sheets relevant to project?

Yes

[Document 1102780 \(Version 2\)](#)

[All versions](#)

Information Sheet - Study 1

[Document 1102781 \(Version 2\)](#)

[All versions](#)

Information Sheet - Study 2

[Document 1103160 \(Version 1\)](#)

[All versions](#)

Consent built in to the start of the online questionnaire (screenshot)

[Document 1107412 \(Version 1\)](#)

[All versions](#)

Information Sheet - New Contact - Prolific

[Document 1107411 \(Version 1\)](#)

[All versions](#)

Information Sheet - New Contact

[Document 1107410 \(Version 1\)](#)

[All versions](#)

Information Sheet - Existing Contact

Consent forms relevant to project?

Yes

<a href="#">Document 1102783 (Version 2)</a> Consent Form - Study 2	<a href="#">All versions</a>
<a href="#">Document 1102782 (Version 2)</a> Consent Form - Study 1	<a href="#">All versions</a>
<a href="#">Document 1107414 (Version 1)</a> Consent Form - Interview	<a href="#">All versions</a>
<a href="#">Document 1107413 (Version 1)</a> Consent Form - Survey	<a href="#">All versions</a>

#### Additional Documentation

<a href="#">Document 1102784 (Version 1)</a> Data Management Plan	<a href="#">All versions</a>
<a href="#">Document 1103317 (Version 2)</a> Interview schedule	<a href="#">All versions</a>
<a href="#">Document 1103315 (Version 2)</a> Measures for inclusion in questionnaires	<a href="#">All versions</a>
<a href="#">Document 1103555 (Version 1)</a> Measures for inclusion in questionnaires (Study 2)	<a href="#">All versions</a>

#### External Documentation

- not entered -

#### Section G: Declaration

Signed by:  
Lee Rabbetts  
Date signed:  
Wed 8 June 2022 at 14:20

#### Offical notes

- not entered -

## Participant information sheet

### **Creative style and leadership style, are they related? If so, what does that mean for followers?**

You are being invited to take part in a research project. Before you decide whether or not to participate, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. Ask us if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part. Thank you for reading this.

### **Research Purpose**

When people research creativity, they usually look at typically 'creative' people and explore how they can be even more creative (i.e. how much creativity can they achieve). This research is looking into something different – we believe that everybody is creative, and we are interested in *how...* we want to better understand creative styles, this is about how you prefer to be creative. This is an under-researched area in work psychology and we'd like to better measure this using the Creative ID by Creative Creatures – an easy to complete questionnaire which can tell you which of five creative styles (Stimulator, Spotter, Sculptor, Selector, Supporter) best describes your way of working. We're particularly interested in investigating whether creative style is in any way related to leadership style – to better understand how different types of creative people prefer to lead their people – what does these different styles mean for the performance of their followers? Are leaders with a particular creative style seen as more effective by their followers? This research is part of a wider project conducted by Lee Rabbetts at the University of Sheffield to achieve his PhD qualification.

### **Why have you chosen me?**

You're currently working in a mid to large size organisation with a number of different leader-follower relationships to explore, we feel that getting to know more about your creative style and leadership style, as well as confidentially exploring how effective you feel your leader is, would be valuable to this research.

### **Do I have to take part?**

It is up to you to decide whether to take part or not. If you do decide to take part, you will be given this information sheet to keep (and be asked to confirm your acceptance of a consent form) and you can still withdraw at any time without any negative consequences. You do not have to give a reason. If you wish to withdraw from the research, please contact Lee Rabbetts using [lmrabbetts1@sheffield.ac.uk](mailto:lmrabbetts1@sheffield.ac.uk).

Please note that that by choosing to participate in this research, this will not create a legally binding agreement, nor is it intended to create an employment relationship between you and the University of Sheffield or Creative Creatures.

### **What will happen if I choose to take part?**

We will ask you to complete a questionnaire, the link to which is attached as part of this communication. This will take you approximately 15 minutes to complete. This questionnaire will have some demographic questions (about your age, employment status, etc.), some questions about your preferred creative style and leadership style and some questions about how you view your leader and their effectiveness (completely confidentially, they will never have visibility of your responses or even know that you have participated).

### **What are the benefits and risks of taking part?**

Having been approved by the University of Sheffield's ethics committee, we don't anticipate any risks in participating in this research.

However, there are benefits! Firstly, you will be helping Lee to achieve his PhD.

But more importantly, we recognise that you are contributing your valuable time to this research and in return we will provide you with a copy of your Creative ID should you want this. Furthermore, you will be invited to a complimentary webinar where the research findings will be presented and you'll gain further information on how you can make the most of your Creative ID in the workplace.

### **Will my participation be kept confidential?**

All the information that we collect about you during the course of the research will be kept strictly confidential and will only be accessible to members of the research team. You will not be able to be identified in any reports or publications unless you have given your explicit consent for this.

### **What is the legal basis for processing my personal data?**

According to data protection legislation, we are required to inform you that the legal basis we are applying in order to process your personal data is that 'processing is necessary for the performance of a task carried out in the public interest' (Article 6(1)(e)). Further information can be found in the University's Privacy Notice <https://www.sheffield.ac.uk/govern/data-protection/privacy/general>

### **What will happen to the data collected, and the results of the research project?**

The data collected will be anonymised before any analysis is conducted – the results of this project are likely to be complete by October 2023 and will be made available to all who have participated in the research. No personal information or identifiable information will be included in any results or publications.

All data will be stored securely by the University of Sheffield and Creative Creatures as joint data controllers in line with GDPR regulations throughout the project. At the end of the project Creative Creatures will continue to securely store the



data. Due to the nature of this research, it is very likely that other researchers may find the data collected to be useful in answering future research questions, as such we cannot give a definite date for deletion of the data collected. We will ask for your explicit consent for your data to be shared in this way.

**Who is organising and funding the research?**

Creative Creatures are funding this research in its entirety.

**Who is the Data Controller?**

The University of Sheffield and Creative Creatures will act as joint Data Controllers for this study. This means that they are responsible for looking after your information and using it properly. Creative Creatures will become the sole Data Controller after the research is complete.

**Who has ethically reviewed the project?**

This project has been ethically approved via the University of Sheffield's Ethics Review Procedure, as administered by the Institute of Work Psychology / Management School.

**What if something goes wrong and I wish to complain about the research or report a concern or incident?**

If you are dissatisfied with any aspect of the research and wish to make a complaint, please contact Lee Rabbetts ([lmrabbetts1@sheffield.ac.uk](mailto:lmrabbetts1@sheffield.ac.uk)) in the first instance. If you feel your complaint has not been handled in a satisfactory way you can contact the Head of the Department of Work Psychology, Prof. Kamal Birdi ([k.birdi@sheffield.ac.uk](mailto:k.birdi@sheffield.ac.uk)). If the complaint relates to how your personal data has been handled, you can find information about how to raise a complaint in the University's Privacy Notice: <https://www.sheffield.ac.uk/govern/data-protection/privacy/general>.

If you wish to make a report of a concern or incident relating to potential exploitation, abuse or harm resulting from your involvement in this project, please contact the project's Designated Safeguarding Contact contact Lee Rabbetts ([lmrabbetts1@sheffield.ac.uk](mailto:lmrabbetts1@sheffield.ac.uk)). If the concern or incident relates to the Designated Safeguarding Contact, or if you feel a report you have made to this Contact has not been handled in a satisfactory way, please contact the Head of the Department of Work Psychology, Prof. Kamal Birdi ([k.birdi@sheffield.ac.uk](mailto:k.birdi@sheffield.ac.uk)) and/or the University's Research Ethics & Integrity Manager, Lindsay Unwin ([l.v.unwin@sheffield.ac.uk](mailto:l.v.unwin@sheffield.ac.uk)).

The scope of the research concerns creative style, leadership style and creativity in the workplace. The research team are not qualified to discuss or provide guidance on issues of a sensitive nature or other topics. Should any issues arise during the course of the research, or should you become distressed or uncomfortable at any time, you are free to stop your participation in the research and it is recommended that you contact their GP or other appropriate medical professional to discuss your issue further and obtain appropriate advice and/or treatment. Furthermore, if you feel that your distress or discomfort is as a direct result of the research methods or methodology, please follow the process for complaints and escalation above. This process should also be followed should you be aware of others (beyond yourself) becoming distressed or uncomfortable in any way as a result of the research. Participation can be stopped at any time, guidance should be sought from an appropriate professional, and processes for complaints followed.

**Contact for further information**

If you have any further queries about the research at all, please feel free to contact:

- Primary researcher: Lee Rabbetts ([lmrabbetts1@sheffield.ac.uk](mailto:lmrabbetts1@sheffield.ac.uk)) : 07706 163160
- Research supervisor: Kamal Birdi ([k.birdi@sheffield.ac.uk](mailto:k.birdi@sheffield.ac.uk))

**Thank you for your time and effort in participating in this research, it is greatly appreciated and unbelievably valuable to Lee, Creative Creatures and people of all creative styles.**

## Participant consent form



### **Creative style and leadership style, are they related? If so, what does that mean for followers? Consent Form for Questionnaire Participation**

#### **Taking Part in the Project**

- I have read and understood the project information sheet, or the project has been fully explained to me. (If you will answer No to this question, please do not proceed with this consent form until you are fully aware of what your participation in the project will mean.)
- I have been given the opportunity to ask questions about the project.
- I agree to take part in the project. I understand that taking part in the project will include participating in a single questionnaire.
- I understand that by choosing to participate as a volunteer in this research, this does not create a legally binding agreement nor is it intended to create an employment relationship with the University of Sheffield.
- I understand that my taking part is voluntary and that I can withdraw from the study at any time; I do not have to give any reasons for why I no longer want to take part and there will be no adverse consequences if I choose to withdraw.

#### **How my information will be used during and after the project**

- I understand my personal details such as name, phone number, address and email address etc. will not be revealed to people outside the project. Additionally, any personal details relating to others that I contribute to the research will be treated with the same level of confidentiality.
- I understand and agree that my words may be quoted in publications, reports, web pages, and other research outputs. I understand that I will not be named in these outputs unless I specifically request this.
- I understand and agree that other authorised researchers will have access to this data only if they agree to preserve the confidentiality of the information as requested in this form.
- I understand and agree that other authorised researchers may use my data in publications, reports, web pages, and other research outputs, only if they agree to preserve the confidentiality of the information as requested in this form.
- I give permission for the data that I provide to be retained and stored responsibly by Creative Creatures so it can be used for future research and learning

#### **So that the information you provide can be used legally by the researchers**

- I agree to assign the copyright I hold in any materials generated as part of this project to The University of Sheffield and Creative Creatures.

#### **Project contact details for further information:**

If you have any further queries about the research at all, please feel free to contact:

- Primary researcher: Lee Rabbetts ([lmrabbetts1@sheffield.ac.uk](mailto:lmrabbetts1@sheffield.ac.uk) : 07706 163160)
- Research supervisor: Kamal Birdi ([k.birdi@sheffield.ac.uk](mailto:k.birdi@sheffield.ac.uk))

If you are dissatisfied with any aspect of the research and wish to make a complaint, please contact Lee Rabbetts ([lmrabbetts1@sheffield.ac.uk](mailto:lmrabbetts1@sheffield.ac.uk)) in the first instance. If you feel your complaint has not been handled in a satisfactory way you can contact the Head of the Department of Work Psychology, Prof. Kamal Birdi ([k.birdi@sheffield.ac.uk](mailto:k.birdi@sheffield.ac.uk)). If the complaint relates to how your personal data has been handled, you can find information about how to raise a complaint in the University's Privacy Notice: <https://www.sheffield.ac.uk/govern/data-protection/privacy/general>.

The scope of the research concerns creative style, leadership style and creativity in the workplace. The research team are not qualified to discuss or provide guidance on issues of a sensitive nature or other topics. Should any issues arise during the course of the research, or should you become distressed or uncomfortable at any time, you are free to stop your participation in the research and it is recommended that you contact their GP or other appropriate medical professional to discuss your issue further and obtain appropriate advice and/or treatment. Furthermore, if you feel that your distress or discomfort is as a direct result of the research methods or methodology, please follow the process for complaints and escalation above. This process should also be followed should you be aware of others (beyond yourself) becoming distressed or uncomfortable in any way as a result of the research. Participation can be stopped at any time, guidance should be sought from an appropriate professional, and processes for complaints followed.

## Ethics approval letter



Downloaded: 27/06/2024  
Approved: 21/06/2022

Lee Rabbetts  
Registration number: 200238162  
Management School  
Programme: PhD

Dear Lee

**PROJECT TITLE:** Creative style: Measurement, state/trait nature and relationship with leadership style.  
**APPLICATION:** Reference Number 044356

On behalf of the University ethics reviewers who reviewed your project, I am pleased to inform you that on 21/06/2022 the above-named project was **approved** on ethics grounds, on the basis that you will adhere to the following documentation that you submitted for ethics review:

- University research ethics application form 044356 (form submission date: 08/06/2022); (expected project end date: 25/10/2023).
- Participant information sheet 1102780 version 2 (09/03/2022).
- Participant information sheet 1102781 version 2 (09/03/2022).
- Participant information sheet 1103160 version 1 (09/03/2022).
- Participant information sheet 1107412 version 1 (08/06/2022).
- Participant information sheet 1107411 version 1 (08/06/2022).
- Participant information sheet 1107410 version 1 (08/06/2022).
- Participant consent form 1102783 version 2 (09/03/2022).
- Participant consent form 1102782 version 2 (09/03/2022).
- Participant consent form 1107414 version 1 (08/06/2022).
- Participant consent form 1107413 version 1 (08/06/2022).

If during the course of the project you need to [deviate significantly from the above-approved documentation](#) please inform me since written approval will be required.

Your responsibilities in delivering this research project are set out at the end of this letter.

Yours sincerely

Email Mgt Research Ethics  
Ethics Admin  
Management School

Please note the following responsibilities of the researcher in delivering the research project:

- The project must abide by the University's Research Ethics Policy: <https://www.sheffield.ac.uk/research-services/ethics-integrity/policy>
- The project must abide by the University's Good Research & Innovation Practices Policy: [https://www.sheffield.ac.uk/polopoly\\_fs/1.6710661/file/GRIPPolicy.pdf](https://www.sheffield.ac.uk/polopoly_fs/1.6710661/file/GRIPPolicy.pdf)
- The researcher must inform their supervisor (in the case of a student) or Ethics Admin (in the case of a member of staff) of any significant changes to the project or the approved documentation.
- The researcher must comply with the requirements of the law and relevant guidelines relating to security and confidentiality of personal data.
- The researcher is responsible for effectively managing the data collected both during and after the end of the project in line with best practice, and any relevant legislative, regulatory or contractual requirements.