

**Implicit person theories and Q-sort:
Personality change in emerging adulthood**

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Abstract

The aim of this PhD project was to investigate personality change in a sample of emerging adults. Change is examined considering both a variable centred and a person centred approach (prototypes obtained from Q-sort). Data were collected using Q-sortware, a web application designed to administer Likert scale tests and Q-sort. To test the equivalence between the paper version and the online version, a study (Study 1) was conducted (N=61). The results revealed that the test retest coefficient (.79) from the answers given via the Q-sortware was satisfactory. To examine personality change, a longitudinal study included an initial sample of 163 emerging adults (Study 2). Participants were tested again after one year (Study 3). In order to find out what determines change, implicit person theories were taken into account. Implicit theories are naïve assumptions about the malleability (incremental theory) versus the fixedness (entity theory) of personal attributes. It was expected that incremental theory subscribers also experience significant personality change. The nature of the association between implicit person theories and personality, and between implicit person theories, Self-esteem and well-being was also investigated.

These topics were addressed in Study 2 (N=163). The results showed that support for an incremental theory was associated with higher scores on Extroversion, Openness to Experience, and Emotional Stability. Support for an incremental theory was also associated with higher scores on Self-esteem and Life satisfaction. Returning participants (Study 3, N=118) showed a mean level increase in Extroversion and a decrease in Conscientiousness, together with high ipsative and rank order continuity. With respect to the prototypes obtained from the Q-sort, "Achievement oriented" individuals showed a significant mean level increase in Conscientiousness, and tended to support an incremental theory of personality attributes.

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To my family, my friends and my supervisor.

"Those who cannot change their mind, cannot change anything"

George Bernard Shaw (1856-1950)

Declarations

I hereby declare that the literature reviews, data collection, analysis and conclusions written in this thesis have been completed by the candidate, under the supervision of his supervisor. Tests and software used in the current project remain the copyright of their respective authors and proprietors.

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Chapter 1: Personality and change

1.1 Personality and change: Aims of the present thesis

Recent interest in personality development has acknowledged that change is possible at every stage of the life course (Ardelt, 2000; Helson, Kwan, John, & Jones, 2002a; Roberts & Mroczek, 2008). In particular, emerging adulthood is characterised by high levels of instability and identity exploration (Arnett, 2004, p.8), thus disconfirming the notion that childhood and adolescence are the only decades in which significant personality change and identity exploration do occur. Indeed, the ages between 18 and 25 are proposed to be more than just a transition between adolescence and adulthood (Arnett, 2000). However, only a few studies have directly evaluated changes among ‘emerging adults’¹. The main scope of this project is to examine changes in personality among them. Indeed, not only will change be examined in multiple ways (differential, absolute and ipsative change²) but also personality is intended as a dynamic construct that cannot be completely captured by traits (McAdams, 1995; Olson & Dweck, 2008). Within the description of personality, an individual encompasses values, motives, personal concerns, and so on. Among these, the attention of the present work goes to implicit person theories (Dweck & Leggett, 1988). This is because implicit person theories are naïve assumptions about the malleability versus the fixedness of personal attributes held by an individual and they have been shown to influence attitudes, plans and future decisions (Dweck, 2008). Despite the large number of studies in over twenty years of research, it is still unclear whether implicit person theories are actually related to personality measures or not. Indeed, this information is essential not only in terms of the external validity of the construct of implicit person theories, but it is reasonable to

¹ Throughout the thesis, emerging adulthood and young adulthood are considered as two separate stages of life. The first refers to ages 18 – 25, whilst young adulthood refers to the following age range, 26 – 40. See section 1.2.2.1 for details.

² See section 1.3 for additional details

believe that according to the implicit theory subscribed to, personality change might be fostered. Thus, a second aim of the current work is to highlight the relationship between personality and implicit theories. Indeed it is important to give a clear theoretical framework about the concept of personality, not only because it is a word often used in common language but also because even in psychology research there are many alternative frameworks and definitions.

In line with what was suggested by McAdams (1995), It will be argued that the description of personality is organised around three levels. The first presents a description of a person through personality traits. This level is purely descriptive and relies on the concept of trait. A trait is a set of stable behavioural tendencies that are sourced from both biological dispositions and cultural influences (Caprara & Accursio, 2001). As will be discussed next in greater depth, this level of analysis is essential for grasping quickly individual differences at a superficial level. Beyond this stage, a second level of analysis includes the evaluation of personal concerns, lay theories, self-esteem, self-discrepancy and life satisfaction. By this means, the description of personality is enriched with a set of possible explanations for those individual differences initially detected on the previous simpler level. The individual is placed in a specific context, clearly located in a given place and at a given time, thus highlighting the chance to determine what causes and determines actual behaviour. There is then a third level of analysis which includes personal life stories; at this stage, a person is fully characterised by his/her life story, which involves a series of interviews and a deep qualitative analysis that are beyond the scope of this work. Indeed, the first two levels of analysis constitute an excellent way to describe personality and personality change and to highlight the reasons for the change. With respect of the first level of analysis, this thesis distinguishes between personality, traits and the Big Five factors (Pervin & Cervone, 2009), which is most common model used to evaluate traits. Personality is a broad and abstract concept and this work supports the definition provided by Allport (see section

1.4.1.1. for a full definition). Indeed, Allport stated that personality is an organising entity, compounded by biological factors as well as environmental influences. Following Allport, the concept of trait is also essential for the conception of personality just mentioned. Traits are then defined as “a generalized and focalized neuropsychic system (peculiar to the individual), with the capacity to render many stimuli functionally equivalent and to initiate and guide consistent (equivalent) form of adaptive and expressive behavior” (Allport, 1937, p.295).

This definition represents very well the concept of trait, which is, however, only a first level for the description of personality, as will be further detailed in section 1.4.1.4. Finally, this thesis distinguishes the concept of trait from its most popular measure, the Big Five (Goldberg, 1993). The expression ‘Big Five’ refers to a model of five traits based on a series of studies which used a psycholexical approach to find personality traits embedded in everyday language (Goldberg, 1993). In short, this approach supports the notion that traits are identified by a significant number of words frequently used within a language. The Big Five traits identified with this approach are Extroversion, Agreeableness, Conscientiousness, Neuroticism and Openness to Experience. For a complete and updated definition of each trait there have been many research studies (Pervin & Cervone, 2009). It should be clarified here that Extroversion refers to a trait assessing how talkative, active and energetic individual is, whilst Conscientiousness refers to a diligent, reliable and ambitious person. Neuroticism refers to the tendency to show fear, anxiety and depression, and can also be considered a measure of Emotional Stability.³ The fifth factor appears to be the most controversial (McCrae, 1994; Ostendorf & Angleitner, 1994), and it refers to curiosity towards other cultures and attention towards alternative ways to frame reality, and is often manifested by an active interest in art-related travel (McCrae, Terracciano, & Project, 2005). The concept of the Big Five is often interchangeably overlapped with the expression ‘the Five

³ For simplicity, the term Emotional Stability is considered as equivalent to inverted Neuroticism

Factor Model' (FFM),⁴ which is also a model for the description of personality based on five traits very similar to those described above. However, the FFM is actually rooted in a series of studies based on a structural approach to the study of personality (Caprara & Accursio, 2001). In short, the five Big Five factors described above are obtained through the analysis of other personality inventories and with a strong set of statistical analyses which ultimately yielded a model of personality based on five factors. So although the Big Five inventory and the Five Factor model yielded almost the same five traits solution for the description of the structure of personality, they are actually rooted in two different lines of research.

1.2 Young adulthood and personality change: An historical perspective

In psychology, understanding the potentiality of change in personality is a crucial aspect as well as the knowledge of its stable components (Lazarus, 1963). In this review, personality and change are investigated with a focus on emerging and young adulthood. Indeed, in this chapter will be argued that emerging adulthood and young adulthood refers to different life stages; the former (age range 18 – 25) is considered the first stage of adulthood, while the second one (age range 26 – 40) represents the stage leading to middle adulthood. These two terms are sometimes used interchangeably but the present work will analyse evidence of their differences because they are considered two separate stages. Towards this aim, three issues are treated in this chapter. First, the literature on personality development in young adulthood is reviewed. Second, a detailed account of how personality change can be operationalised is given. In fact, a number of coefficients are used to measure change in personality and each of them addresses a separate issue and pertains to a specific meaning of change (Caspi & Roberts, 2001). To illustrate, high rank order stability in Extroversion, does not preclude

⁴ However, for simplicity the expressions 'Five Factor Model' and 'Big Five' are used interchangeably in this thesis.

its mean level variations over time. Finally, some suggestions for future research are presented and the theoretical perspective adopted in this thesis is introduced.

1.2.1 The previous focus on childhood and adolescence

The interest in early adulthood as a stage of life in which significant change occurs is relatively recent (Robins, Fraley, Roberts, & Trzesniewski, 2001). Indeed, for many years, over the last century, personality change seemed a prerogative of early childhood and adolescence; with respect to the latter, a strong line of research defined it as period of rebellion, often connected with aggression, crime, drug abuse and antisocial behaviour (Demos & Demos, 1969; Elkin & Westley, 1955; Hall, 1904; Rogel, Zuehlke, Petersen, Tobinrichards, & Shelton, 1980).

Psychodynamic approaches, for instance, argued that the Oedipal complex is a crucial step in defining personality, more or less at around five years old (Freud, 1970). After this age, no substantial change is expected and personality is considered hardly malleable during adolescence and adulthood. In contrast with this rigid view, Erik Erikson acknowledged a number of peculiarities in early adulthood, which was also identified as a specific stage of individual development (Erikson, 1950). According to his theory of personality development, from age 20 to 24 the main *challenge* to a safe maturation lies in the achievement of a deep intimacy with a partner, often culminating in a marriage based on communion and love. Apart from few exceptions (Witkin, Goodenough, & Karp, 1967), young adulthood was still largely ignored by studies on personality development. In contrast, adulthood in general was depicted as a happy ending after turbulent adolescent years. For decades, research underpinned the idea that this stability represented the successful conquest after upheavals, conflicts with parents and a general 'storm and stress', partly due to biological changes (Nesselroade & Baltes, 1974; Stein, Newcomb, & Bentler, 1986). Only specific events or the

acquisition of a relevant status such as becoming a parent were regarded as driving significant change (Kandel & Logan, 1984).

1.2.2 Personality change and young adulthood

At the end of the last century, the notion that personality is malleable even after adolescence started to attract attention. This assertion finally convinced even strong supporters of stability. Costa and McCrae (1997; 1994; 2010), for instance, concluded that personality *is set like a plaster* at the age of thirty, as previously speculated by William James (1890). Recently, however, (Terracciano et al., 2010), Costa and colleagues barely shifted their point of view when they wrote that “stability does not imply immutability” (p.31). In other words, they admitted that the decade between the twenties and the thirties is implicitly valued as a source of change. In his review of personality and its relation with age based on rank order coefficients, Del Vecchio found high levels of stability during adulthood, except for adults aged between twenty and thirty, despite her initial thinking being in favour of James's set-plaster theory. It is nonetheless after reaching fifty (age range 50 – 59) that personality traits reach their peak of stability (.55) (Roberts & DelVecchio, 2000).

However, studies directly addressing malleability in personality are still sparse and have yielded inconsistent results. In contrast, a large body of research sustaining the opposite idea has appeared to be consistent and clear (see for instance, Helson et al., 2002a; Roberts, Walton, & Viechtbauer, 2006; Soto & John, 2012; Srivastava, John, Gosling, & Potter, 2003).

According to Helson and colleagues (Helson et al., 2002a), this was primarily due to methodological issues related to the calculations necessary to evaluate change; in contrast, stability coefficients are easily interpretable and highly consistent. One remarkable attempt at a comprehensive analysis of change came from Robins and colleagues (2001), who claimed that longitudinal studies sometimes fail to detect

personality change in early adulthood because the span considered was too broad. In their sample of college students (N=270, aged from eighteen to twenty-two), the participants completed a personality assessment based on the FFM annually for four years. The authors conducted an in-depth analysis considering mean level differences, rank order coefficients and structural and ipsative data. With regards to mean level changes, the results showed significant increases in Emotional Stability, Conscientiousness and Agreeableness in the decade of the twenties. Extroversion and Openness to Experience showed a significant decrease. Moderate rank order stability was found in all traits with the exception of Conscientiousness and Neuroticism. Structural equation modeling was performed to assess structural change, but the analysis did not yield any relevant results. Ipsative coefficients also showed no significant variation over time. The authors concluded that personality in the early adulthood years (18 - 22) showed a pattern of stability and changes according to the coefficient analysed. Given the purely descriptive nature of the study, no information was given about mechanisms that might trigger these changes.

Neyer and Lehnart (2007) studied personality and intimate relationships over eight years in a sample of young adults (n=339, age range 18 - 30), assessing them three times with a measure of the Big Five plus Sociability, Self-esteem and Shyness. The authors found that personality change was responsible for qualitative change in relationships with relevant others, such as family members and peers. Indeed, those individuals who increased in Sociability and Neuroticism over eight years were more likely to establish an intimate relationship. In conjunction with these results, these participants showed higher levels of Emotional Stability, Conscientiousness and Agreeableness. At T3, the participants significantly increased in Sociability, but not in Extroversion. Rank order stability was below .60 for Self-esteem, Sociability, Neuroticism and Agreeableness. In conclusion, the contribution of this current study lies in the association between personality and contextual factors, therefore moving a step

closer toward the knowledge of what triggers change in young adulthood, other than the mere flow of time. Recent evidence, however, has suggested that young adulthood is preceded by another stage identified as emerging adulthood (Arnett, 2000); further details on this theory help to shed light onto personality development before middle adulthood.

1.2.2.1 Emerging adulthood

Jeffrey Jensen Arnett (Arnett, 1998; Arnett & Taber, 1994) conducted a sociological analysis of young adulthood in the US, but his findings are plausibly applicable in many other countries and socio-cultural contexts. In fact, in those western countries where a large portion of the population has access to higher education (such as a university), young adulthood is preceded by a stage recently identified as "emerging adulthood" (Arnett, 2000). These years, roughly ranging from the late teens to the mid-twenties (18 – 25) should not be seen merely as an extension of adolescence. During the teenage years, in fact, youngsters are still progressing towards adulthood, whereas emerging adults perceive themselves as more mature and responsible. On the other hand, they are still exploring their identity; the availability of money and more independence from parents, for instance, provides new experiences that might impact on their identity and personality (Arnett, 2007). These are years of being self-focused, in which young people are looking for opportunities in intimate relationships as well as personal achievement (Arnett, 2004). Conversely, the concept of adulthood does not fit well with them, given that they are hardly involved in demanding roles such as parenting or high career responsibilities. According to Arnett, the term used for adolescence by Talcott Parsons (1942), a "roleless role", is still a good expression to characterise emerging adults nowadays. This is because there are no demographic indicators uniquely associated with these years. Some emerging adults are attending university or college, others are already working or have just settled into a new family, whilst others might still live at their parents' house, maybe looking for an adequate occupation. On the

one hand, they seem determined to plan their future carefully, but on the other hand they refuse to set up their life in a definitive manner as young adults would do. For its specificity, this decade is of particular interest for personality development and change. World views, work experiences and intimate relationships are identified as three main areas through which identity formation and exploration is achieved (Arnett, 2006). In their '*instability*', these years represent an excellent chance to investigate personality change (Robins et al., 2001). Arnett also specified that emerging adulthood is not necessarily a key stage in every societal context. According to the cultural background considered, in fact, individuals may arrive at the age of twenty with no opportunity to experience many options if an external pressure or imposed habits push them towards a stable job or demand for family creation, as in many Asian cultures or in places with restricted education opportunities, such as a large proportion of African countries. It should be noted, in conclusion, that Arnett's work is mostly restricted to US society; the 'detection' of emerging adults in other industrialised cultures still seems to be at a conjectural level (Arnett, 2006).

1.3 Conceptualisations of change

Recent publications based on longitudinal designs have proposed that detecting change involves giving attention to a number of aspects that constitute matters of debate and whose discussion lies outside the aim of this current PhD project (see for instance, Helson, Jones, & Kwan, 2002b; Helson et al., 2002a). Although the debate on these aspects is still ongoing, there are well established practices regarding conceptualisation of change: absolute change, differential change, ipsative change, structural change and coherence are briefly described here, with attention to the first decade of adulthood (see Table 1.2 below). A discussion of these concepts focuses attention on change beyond its meaning in everyday conversations. Indeed, even the literature in this field is often restricted to only one of these indicators.

Table 1.1

Conceptualisations of Change

Name	Description	Method
Absolute change Normative Mean level	Variations of a target attribute over time (for example, Extroversion)	T-test
Differential change	Relative position of a target attribute within a single individual or groups (for example, Neuroticism stability relative to the stability of the other four traits in FFM)	Correlation coefficient
Ipsative change	Change at individual level. Variations in the configuration of variables within a person are considered	Various techniques (such as Inverted factor analysis, D ² analysis)
Structural change <i>and</i> Coherence	Variations in the pattern of correlations among a set of attributes Behavioural variations over time, with regards to specific attributes that might express themselves through different behaviours (heterotypic versus homotypic)	Structural equation modelling Change in behaviour should be first identified from the theory

1.3.1 Absolute change

Absolute or normative change is the most common indicator used to assess personality change. The focus is on the variation of a trait in a sample of individuals over time. To obtain this coefficient, two separate measures are necessary, then the mean difference is computed between a given T1 and at T2. As already noted, there are two schools of thoughts regarding absolute change detected over the life course: one puts a strong emphasis on personality stability (Gustavsson, Weinryb, Göransson, Pedersen, & Åsberg, 1997; Terracciano, Costa, & McCrae, 2006), and the other challenges this conclusion (Mroczek & Spiro, 2007; Roberts & Helson, 1997; Robins et al., 2001; Robins & Pals, 2002). Roberts (2006), in particular, concluded that the latter is actually more convincing: he reviewed more than 90 studies, paying attention to gender and age decades. The results were expressed in terms of the Big Five traits: only Extroversion

was split into two sub-traits, 'Social Vitality' and 'Social Dominance'. The first showed a significant drop over emerging adulthood/young adulthood, whereas the latter followed the opposite pattern. Through the decades ranging from the late teens to age 29, significant increases in Agreeableness and Conscientiousness were shown, whereas Neuroticism decreased. These trends suggested that age is one of the most important indicators of personality development: the larger the age span, the greater the magnitude of change. Personality over the whole life course continues to develop, suggesting that it is not set like plaster, even during old age (that is beyond 65). However, traumatic experiences, changes in financial status or within the work environment, and family formation or its disaggregation were all reported to be sources of permanent and rapid change.

In a study dealing with two separate samples (Soto & John, 2012), one followed longitudinally (N=125 from age 21 to age 53) and the other cross-sectional (N=601, age range 20 - 64 M=47.68), a comparison between the data obtained from the two was performed, with attention to facets from the FFM. The authors claimed that the five traits represented broad domains that fail in detecting personality change, whereas at facet level there is a better chance to reveal the fine mechanisms driving personality development; Openness to Experience, for example, showed a decline from young adulthood to senescence, but only at the facet level did this information become valuable. The facet 'Adventurousness' decreased significantly, whereas the other two, 'Intellectualism' and 'Idealism', stayed the same. Similar to the results of an earlier meta-analysis by Roberts (2006), Extroversion showed a mean level change only at facet level; 'Assertiveness' and 'Social Confidence' increased, while 'Gregariousness' displayed the opposite pattern.

Taken together, these results show that mean level change during young adulthood is well documented at least in the domain of the FFM. However, these studies did not clearly distinguish emerging adulthood from young adulthood, thus creating a

void of knowledge as far as the differences between the two stages is concerned. Broadly, increases in Conscientiousness, Emotional Stability and Agreeableness, together with a decrease in Openness to Experience, appear to be part of a maturational process during the first decades of adulthood.

1.3.2 Differential change

Differential change expresses rank order variations in an individual's relative position within a group and is indexed by a correlation coefficient. In their review of personality change and age, Roberts and Del Vecchio (2000) tested a number of hypotheses to prove a relationship between rank order consistency and age; specifically, they expected to find a peak of personality stability at around thirty years of age, as suggested by Costa (1994). Despite the heterogeneity of the studies reviewed, not only was it found that personality stability was lower than expected (in other words, the set-plaster perspective), but it was also highlighted that trait consistency reaches its peak later in life, only at fifty years of age. In a way, the authors implied that during the decade of emerging adulthood, from the twenties to the early thirties, personality does change. Mean trait consistencies are particularly low compared with the other decades of adulthood and senescence; .51 to .57 in the twenties compared to .62 in the thirties, .59 in the forties, .75 in the fifties, and .72 in the sixties.

Another noteworthy study based on a sample of almost 15,000 individuals representing the generality of the German population examined differential change across the life course among other variables involved. Data came from an ongoing longitudinal study dealing with personality change and the impact that major life events (such as divorce, separation, unemployment) might have on personality development (Specht, Egloff, & Schmukle, 2011). Previously, such major events were not considered to contribute to long term trait change. The results showed that rank order stability traits followed an inverted U-shaped trend. This means that the first and the last decade

considered, the twenties and the seventies, are characterised by the lowest level of stability (below .60 and a little above .60, respectively). In contrast, Conscientiousness appeared to be the only trait following a linear increase throughout the age span. Rank order coefficients were interpreted only in terms of high versus low consistency rather than as a direct indicator of change. However, it should be noted that research concerning rank order consistency has helped to establish a clear relationship between age and personality change, although much more needs to be done to establish what determines this consistency.

1.3.3 Ipsative change

Mean level and rank order change indicators are representative of a variable centred approach in which individual differences are spelt out through a set of variables, usually considered relevant for the description of an individual, as in the Five Factor Model. This means that both mean level and rank order changes refer to traits that are supposed to summarise personality to a satisfactory degree. Even so, they do not provide information at an individual level as they are isolated pieces of information. In contrast, ipsative or *morphogenic* change directly informs about individuals, thus it is an expression of a person centred approach which is described more fully next (see section 1.4.1). The term 'ipsative' derives from the Latin (*ipse* = self), and it was first introduced by Cattell (1944). Thus, change in personality reflects variations in a configuration of variables within a single individual as it expresses a direct consequence of change in a target profile, measured at a given T1 and T2. One popular example of ipsative change is represented by personality types, in which personality change is monitored by observing personality types over time.

In the early 1970s, Block (1971), using a longitudinal study on personality development, followed a sample of more than 100 individuals for more than 25 years, from childhood until thirty years of age. Although Block was not a psychoanalyst, he

supported the idea that early childhood was an important predictor of personality characteristics during young adulthood. By focusing on prototypes in children, produced by inverted factor analysis from Q-sort,⁵ he found high levels of stability in his sample, as he managed to replicate the prototypes originally extracted. His three-prototype⁶ solution (over controlled, under controlled and resilient) was also replicated more recently (Asendorpf & van Aken, 1999; Hart, Hofmann, Edelstein, & Keller, 1997; Robins, John, Caspi, Moffitt, & Stouthamber-Loeber, 1996). However, it should be noted that the primary focus in these latter studies was the identification of personality types in children and their replication during adolescence, rather than personality continuity/change. Additionally, personality types are not the only way to identify ipsative change; in the above mentioned study by Robins and colleagues (Robins et al., 2001), for instance, an ipsative coefficient was obtained from a measure of the Big Five with the analysis of D^2 (Cronbach & Gleser, 1953), and a coefficient for elevation, scatter and shape of a target profile was measured at least in two occasions. The results showed that only 17% of the total sample significantly changed over a period of four years, from late adolescence to young adulthood. In fact, this method for the assessment of ipsative change is still based on a personality test rooted in a variable centred approach, as will be discussed next in section 1.4.1; this might lead to an inaccurate assessment of ipsative personality change.

A third methodology involves Q correlations, which are the equivalent of a Pearson momentum correlation between profiles at a given T1 and T2 (Cattell, 1957; Ozer & Gjerde, 1989). In other words, the correlation is between individuals' answers to the whole sets of items of a given test, rather than between the scores calculated from each subscale.

⁵ For more details on how to derive prototypes, see section 5.2.4.

⁶ For simplicity, the terms 'types' and 'prototypes' here both indicate a description of individuals using a person centred approach. However, they lead to different concepts, as explained in section 3.1.3.

To sum up, research on ipsative change in personality provides evidence for moderate stability in young adulthood (Robins et al., 2001). This conclusion, however, should be treated with caution for at least two reasons; first, data on ipsative change are still scarce, especially as far as emerging and young adulthood are concerned. Second, when previous researchers used ipsative indicators it was often to prove personality consistency through adolescence to young adulthood, therefore failing to address personality stability/change in emerging adulthood considered as a separate stage of life.

1.3.4 Structural change and coherence

Other ways to conceive personality change are structural change and coherence. The former is measured by assessing variations in the correlation pattern between traits over time (e.g. Morizot & Le Blanc, 2003). Factor analysis and structural equation modeling are usually employed for this purpose. In particular, in factor analysis items (or variables) are correlated with latent variables which they are thought to describe; the corresponding coefficients help to explain the unique variance of each item with the latent variable of the model (Rausch, 2009). Significant variations of this model reflect structural change. Similarly, in structural equation modeling correlations between traits describing the personality of a target individual are then observed over time. Variations in the associations between these traits reflect change in the internal structure of the personality. However, models are usually very complex, and it is often difficult to distinguish the actual structural change from variations due to errors. In this sense, longitudinal studies based on structural changes typically consider a large age span in order to clearly yield reliable results. This issue makes this methodology unsuitable for the purposes of this thesis because the focus is on short-term personality change in emerging adulthood. Additionally, research on this topic is too scarce to formulate any hypotheses. In fact, although the study of structural change during adulthood is rather

interesting in principle, it deserves a proper line of research which is beyond the scope of this thesis. On the other hand, the concept of coherence stands for change in heterotypic behaviours. When longitudinal studies follow children until adulthood, it may be the case that traits are expressed through different sets of concrete behaviours (For an example see Caspi, Elder, & Bem, 1988). Therefore, coherence in personality can be explored in conjunction with a strong theory on how traits can be expressed differently across various stages of life. Again, for this method to be effective, a very long age span should be considered as it is reasonable to expect that there is always a high level of coherence within short periods of time. These two approaches to change in personality are particularly fruitful in developmental psychology and temperament research among children, therefore they seem inadequate for the aims of the current project.

1.4 Can Personality change?

After this exploration of the literature on young adulthood and personality change, some conclusions can be drawn. First, significant change is found at every stage of personality development (Neyer & Lehnart, 2007; Roberts et al., 2006; Specht et al., 2011); the review of past and most recent literature has shown an evident shift from a fixed conception of personality, when change was uniquely associated with childhood and adolescence, to a large body of research that exhibits the dynamic nature of personality, in which patterns of continuity and change can be detected from childhood to senescence (Ardelt, 2000; Caspi & Roberts, 2001; Labouvie-Vief, Diehl, Tarnowski, & Shen, 2000; Srivastava et al., 2003). Second, emerging adulthood is recognised as a privileged perspective for the study of personality development, not only because of the intrinsic maturation of this decade, but also thanks to its peculiarities, such as identity exploration, mature love and family formation, as well as attention to career/stable jobs (Arnett, 2000). Third, there are many alternative ways to conceptualise change, each of which is associated with an aspect of personality

development. This justifies why change from mean level coefficient, for instance, does not imply rank order change on a given trait, and none of them give an account of individual change, which is a prerogative of ipsative change indicators.

Moreover, the richness of statistical techniques and methods available for data analysis do not lead to a consequent diversity of tests and instruments in actual studies; rather, it seems that one single instrument is often used and statistical analysis tend to overextend the boundaries of its application (that is, traits measured by the Big Five). Indeed, research over recent decades has been repeatedly based on the FFM, often referred as the most convenient 'language' even when reporting findings from other tests (Roberts et al., 2006). Without neglecting the importance of traits as a theory within a variable centred approach, personality is something more than a scattered set of variables acquired through Likert scale questionnaires (King, 2010). Indeed, the risk connected to the over-use of one method is that the debate on personality is considerably restricted to one source of information.

1.4.1 Person centred versus variable centred approaches to personality

1.4.1.1 Some definitions

Early in the last century, Gordon Allport defined personality as “*a dynamic organization within the individual of those psychophysical systems that determine his unique adjustments to his environment*” (Allport, 1937, p.48, italics added). In this definition of personality, the central elements appeared to be the dynamicity and the uniqueness of an individual. Despite this early acknowledgement of the relevance of individuality (the person centred approach), I agree with Asendorpf (Asendorpf & van Aken, 2003; Hart, Atkins, & Fegley, 2003) that personality is often measured in such a way that ends up being far distant from the original intention evincible from this definition. Clearly, the necessity to isolate variables and their manipulation led to an overwhelming attention on a variable centred approach.

The expression 'variable centered' was first used by Jack Block (1971) to indicate the study of personality based upon separate and independent variables (for example, traits and social dominance). Traits are like isolated, acting agents promoting behavioural change and predicting other variables (outcomes). The aim of this approach is to spell out general principles for the description and perhaps the prediction of future behaviour. In this sense, the Five Factor Model is a perfect example of how trait psychology describes personality using a concise set of variables which are equally relevant to all individuals.

In a person centred approach, in contrast, variables lose their central role because they are mere properties of a target person, who is now the centre of the analysis. By producing profiles, for instance, groups of individuals who share a number of characteristics can be identified in order to describe their life outcomes and behaviour. This change in perspective puts an emphasis on the relevance that some variables have for a target group, suggesting that they are identified by another set of variables and therefore involved in a different developmental pathway.

Despite the unique source of information obtainable from a person centred approach, the variable centred perspective appears to be the principal method employed in longitudinal studies evaluating personality and personality change, with a consequent loss of information, as discussed next.

1.4.1.2 Towards integration: A multi-perspective approach to personality

In the attempt to seek the reasons why the person centred approach is still left to the side of the research mainstream, some authors have identified three main misconceptions about the use of person centred approaches in personality research (Laursen & Hoff, 2006). They observed that this perspective is believed to be onerous and obscure in terms of statistical methods, and often confused with qualitative research (misconceptions one and two). Finally, (misconception three) some statistical techniques, such as interaction terms used in a multiple regression, were generally

believed to be a good replacement for a proper person centred approach, because traits are not analysed separately. However, neither the first two nor the latter belief reflect a real concern about a person centred approach. In fact, statistical techniques are clearly explained in many articles from past and recent research (Asendorpf & van Aken, 1999; Robins et al., 1996; York & John, 1992). Additionally, a person centred approach typically works within quantitative methods, as pointed out recently (Asendorpf, 2009); it should be remembered, indeed, that even when the configuration of variables co-varying together is considered, the initial source of information is still based on isolated variables, rather than individuals (misconception number three). In a longitudinal study based on a person centred approach, in fact, the personality development of groups of individuals (prototypes) is followed over time and therefore the attention is shifted to changes identified in the profiles. The results yield information about the intra-individual maturation of that specific group of concrete people. In a variable centred approach, in contrast, the same longitudinal study would conclude that some traits measured at a given T1 are associated with a consequent outcome at T2, but the degree to which these traits impact on individuals' concrete lives remains committed to the probability that the average person included in the sample analysed represented a real individual. In conclusion, it seems that in a person centred approach, the unique contribution to the study of personality is rooted in the attention to concrete individuals and their actual behaviour. The dichotomy between the person and the variable centred approaches, however, should not imply an opposition between methodological views; rather, an integration of both approaches seems a better practice for a comprehensive study of personality. In line with that suggested by Asendorpf (Pettit, 1999), I refer to this combination between the two methodologies as *a multi-perspective* approach to personality. In order to explain how this integration is intended to be achieved here, further details of the theoretical framework adopted in this project are given next.

1.4.1.3 A theoretical framework for an integrated approach

According to McAdams (1995), the description of an individual can be organised around three levels. The first concerns traits. The notion of trait (Allport, 1937) was first introduced to describe a set of behaviours biologically rooted and then shaped by experience. A trait is a broad concept that integrates habits, attitudes and concrete behaviours and it is conceived to be a central component of an individual's personality. A number of features within traits justify the popularity of this concept. Traits are brief labels by which to summarise non-trivial aspects of a person, especially with respect to individual differences (Pervin & Cervone, 2009). In this sense, they are distinguished from types, which, put simply, represent categories or taxonomies of individuals. Apart from the debate on the origin of traits, this concept shows a strong longitudinal validity; traits can be used to anticipate behavioural patterns and enduring dispositions (Costa & McCrae, 1997; John, Angleitner, & Ostendorf, 1988). The FFM became the most popular theory stemming from traits research (Costa & McCrae, 1997; McCrae & Costa, 1982, 1997). Indeed, there is clear evidence to show the existence of a FFM in many cultures (Goldberg, 1993; Goldberg & Shmelov, 1993; McCrae et al., 2005).

Despite their popularity in research, there are several concerns relating to the actual validity and the quality of the information obtained from the assessment of the Big Five traits. Although these traits are more than a linguistic convention, they do not explain behaviour (Block, 1995).

1.4.1.4 Some limitations of the trait approach

In an analysis of statistical issues concerning the Big Five, Peter Becker (1999) published a comprehensive critique of the theory. He claimed that despite the FFM's aim to assess personality with the help of five factors, there is strong evidence that only two factors (Blackburn, Renwick, Donnelly, & Logan, 2004) or even one factor (Just, 2011; Musek, 2007) might represent an alternative solution for a more focused assessment of personality, at least from a statistical perspective. Recent evidence has also questioned

the quality of factor analysis used to obtain the five factors structure, suggesting that it is neither an ultimate answer to personality assessment nor even the most complete (De Raad, Barelds, Mlačić, Church, Katigbak, Ostendorf, Hřebíčková, Di Blas, & Szirmák, 2010). Indeed, it seems that a sixth and even a seventh factor might be added to the FFM (Ashton, Lee, Perugini, Szarota, de Vries, Di Blas, Boies, & De Raad, 2004). Cultural psychology suggests that the concept of trait, and more specifically the measurement of personality, stemming from the Big Five reaches its best within English-speaking countries and specifically within the US (strongly individualistic) cultural context (Cheung, Leung, Zhang, Sun, Gan, Song, & Xie, 2001). As we move beyond the boundaries established by the lexicon that produced the five factors towards eastern cultures, the FFM seems not to include some relevant aspects of personality, as shown by research using the HEXACO-P personality assessment (de Vries, de Vries, de Hoogh, & Feij, 2009). In conclusion, I agree with McAdams that by stopping our inquiry into personality at the concept of trait, individuals are described only at a superficial level, with a consequent simplification of the results obtained. However, the perspective assumed here does not neglect the role of the Big Five in measuring personality; rather, traits and the FFM should be framed with a conscious understanding of their advantages and limitations.

1.4.1.5 Beyond traits: Motives, values and scopes. A second level of analysis

All the limitations discussed above are partially overcome by the use of a second level of analysis, which McAdams defined as the level of motives, or personal concerns (McAdams, 1995; McAdams & Olson, 2009). This label is actually quite generic, but it is the best way to summarise all the motives, values, situations, strivings and goals that characterise each person in greater depth. Beyond the dispositional level, personal concerns enable us to put an individual into a context so as to place him/her at a given space and time. If at a dispositional level I am able to say that a target person was extroverted more than the 'average subject', by means of a close look into his or her

personal concerns, the same person, for instance, could act in an extroverted way only in particular contexts, maybe because he or she values dominance in social situations or because this is the best way to enhance his or her Self-esteem. According to my view, this is the level at which implicit person theories are located (Dweck & Leggett, 1988), thus representing a major theme for this thesis, and this is extensively discussed next, in Chapter 2. At a further level, the third one, McAdams identified a stage in which the individual is fully described by his/her life stories. However, by looking closely into the personal life story within each individual separately, there is a shift from a quantitative analysis to a qualitative level. In line with my aims here, it is premature to move into this stage; rather, it is preferable to look at personality with the support of the quantitative methods in order to draw conclusions about emerging adults as a population of interest.

1.5 Conclusion

The research evidence reviewed here has indicated that personality change is possible at every stage of the life course, from childhood to old age. In particular, emerging adulthood would appear to be a critical decade, strongly characterised by instability. Only a few longitudinal studies have directly addressed personality change during emerging adulthood, and most of them have been limited to absolute or differential change. By doing so, research over recent years has been detached from the assessment of real people and concrete behaviours. This thesis encourages a new route in personality psychology research with a method based on a multi-perspective approach to individuals, in which both a person and a variable centred approach contribute to recovering the centrality of real individuals. Influenced by this awareness, the current project has sought to examine personality change in a sample of emerging adults in order to describe how personality develops in these years characterized by high instability and identity exploration. Table 1.2 provides a quick overview of the main experiments and samples included in this work. Finally, I want to shed light on motives

and implicit assumptions which co-occur within personality development. This implies giving attention to those implicit theories that drive individuals' decisions. In order to clarify the boundaries of this construct, the next chapter reviews the theory behind it.

In particular, this chapter has dealt with personality and change in early adulthood; then some methodological issues have been discussed as far as personality and change assessment are concerned. Chapter 2 will discuss the concept of implicit person theories as a knowledge structure. The aim of this critical review is to explain concepts, definitions and applications of implicit person theories with an emphasis on previous research and the relationship between personality and implicit theories. Chapter 3 will introduce the Q-sortware as a web tool for computer and on-line based administration of experimental procedures that include both the Q-sort and Likert scale tests. Chapter 4 will then test the Q-sortware; a reliability analysis will be performed to show the equivalence between the paper-based and the computer based versions of the tests chosen for this project. Chapter 5 will include the first part of the longitudinal study. It will be hypothesised that implicit person theories are associated with personality; specifically it is predicted to find a positive correlation between support for an incremental point of view and Openness to Experience and Extroversion. Then, prototypes obtained from the Q-sort (Block, 1971) will be explored in order to establish the extent to which individuals relate to a growth mindset or a fixed one. This is because I am interested in the assessment of personality using both a variable centred (traits) and a person centred approach. Chapter 6 will deal with the second and final part of the longitudinal study and it will be subdivided into three separate sections. The first will analyse personality change considering mean level, rank order and ipsative statistics. The second will include data from the second wave only (T2) in order to corroborate what was found at T1 (presented in Chapter 5). The third will discuss the replication of personality prototypes at T2 and their respective relationships with implicit person theories. Chapter 7 will recapitulate the results and findings and it will be subdivided into

three sections, one for each empirical chapter. In each section there is a summary of findings and their theoretical implications with additional comments and some suggestions for future research. The chapter ends with some final consideration and a general conclusion is drawn.

Table 1.2
Overview of the main studies and aims

	Aim ^a	Sample (n, age range)	Data analysis
Study 1	Reliability of the Q-sortware	52, (17 - 48)	Test-retest reliability measure
Study 2	Evaluation of the association between personality and implicit person theories, and with personality and self-discrepancy;	162 (17 - 26)	Zero order correlations
T2	Examination of personality change (i.e. mean level, rank order and ipsative) during emerging adulthood	117 (18 - 25)	various analyses according to the coefficient examined: Mean level: Independent t test Rank order: zero order correlation Ipsative: Q-correlation ^b

Notes. ^a For simplicity, only main aims related analyses are shown in this table. ^b With the term Q-correlation is intended a correlation coefficient. More details are on page 14

Chapter 2: Implicit theories of personality

2.1 Overview of the chapter

In order to describe the role of *Implicit Person Theories* (IPT), this second chapter reviews the relevant literature and key findings. Definitions and questionnaires used to measure this construct will be discussed, together with the main applications of the theory and its implications over more than twenty years of research. The chapter starts with a discussion of the association between implicit person theories and motivation as well as achievement in schools. Other applications and findings in the area of developmental and social psychology, stereotypes, judgments and conceptions about morality will be reviewed. For a fuller picture to emerge, some of the latest works are outlined with respect to other branches of psychology in which implicit person theories have found a fruitful application, such as work and sport activities. The chapter ends with some critiques, a discussion of methodological issues and suggestions for further research.

2.2 Introduction

The implicit theories of human attributes imply support for different world's view in order to interpret, control and anticipate events and take decisions for future actions (Dweck & Leggett, 1988). The antecedents of this theory are rooted in Kelly's idea of personal constructs; they can be seen as frameworks that set up actions for future plans (Kelly, 1991). In this view, personal constructs are real interpretations of facts and therefore implicit theories of personality exemplify one of these interpretations. Implicit theories are then a super-ordinate construct applied to personality attributes, and this is

polarised between entity and incremental theorists. The entity theory, sometimes known as the 'fixed mindset' (Dweck, 2006), refers to the belief that one's personality is something fixed that cannot be changed. Entity theorists describe people in terms of broad attributes. In doing so, they use a trait-like language: this implies that others' behaviour is quickly processed and understood with few basic traits (Chiu, Hong, & Dweck, 1997).

In contrast, the incremental theory, sometimes known as the 'growth mindset', states that personality is changeable even in its most basic attributes. Change is perceived as achievable through time and effort. An incremental theorist describes others using several viewpoints because others' behaviour is explained in terms of multiple processes, such as environmental and social factors, situational cues and cultural pressure. Over more than two decades of research in the field, implicit theories have proved their relevance in the field of motivation, intelligence, moral judgment, social interaction and personality, among others (Dweck, Chiu, & Hong, 1995).

2.3 Concepts and definitions

Implicit theories have found several applications in many branches of psychology. However, the label 'implicit theories' of personality might be somewhat confusing, given that there are various conceptualisations closely related to it and which share this expression. In a review of early formulations which used the label 'Implicit Personality Theory', Schneider (1973) distinguished two different approaches; the first referred to the bias consistently shown by individuals when judging others. The second dealt with people perception. According to this line of research, individuals hold implicit conceptions about the relationships between traits. These conceptions should be kept in mind when researchers are working with trait measurements as these lay theories might be

a source of error. This second tradition is closer to Kelly's personal construct theorisation, which is in turn the actual background from which the concept of implicit person theories stemmed. The idea that some traits *go together* produces expectations that are used to predict others' behaviour. Cronbach (1953) argued that these lay theories might have slightly different psychometric properties. Although this theory did not raise further interest at that time, it is an interesting suggestion. In this sense, this conceptualisation is also quite different from Dweck's purpose. In fact, the latter simply refers to the perception of the malleability of a specific attribute whereas the former refers to broad groups of individuals who are perceived similarly.

As well as this issue, a number of theories are related to the 'perception of control' and it is worth discussing them. Dweck herself attempted to clarify her views in order to make evident the point addressed by this construct (Dweck & Legget, 1988). Indeed, popular formulations such as the *Locus of control* (Rotter, 1966), and the *attributional approach* (Weiner, 1972) share some aspects with the implicit theories; at the same time, they differ in many ways.

As regards the Locus of control, Rotter proposed that individuals differ in terms of perceptions of control over events. This perception refers to the expectancy that a person can influence (internal Locus of control) or not (external Locus of control) specific events or whatever is happening around him/her. In contrast, implicit theories refer to the malleability of a personal attribute rather than an event, an outcome or a performance. Conceptually, implicit theories do come 'before' the Locus of control; it can be argued, for instance, that an incremental personality theorist believes that change is always possible, hence, it will be easier (but not inevitable) for him/her to develop an internal Locus of control about a target performance. This distinction between the two theories entails the view that support for an incremental mindset does imply expectation of change, even if the perception of control over a target performance is quite low. In contrast, an entity theorist might believe that change is possible only if the perception of

control is particularly high. This is because they do not trust in time and efforts for a better outcome. From an empirical point of view, Dweck and her colleagues (Dweck et al., 1995) tested the relationship between the Locus of control and implicit theories of intelligence; the results showed a positive relationship between support for an incremental point of view and an internal locus of control, although the overlap was tiny ($\beta = .15$ $p < .01$).

As far as the attribution theory is concerned, Weiner (1972) posited that as naïve psychologists, individuals tend to attribute failure and success to their performances by examining several variables (stability, Locus of control, difficulties related to the task and personal effort). These aspects affect their emotional reactions and set up their future behaviour. Thus, if an individual explains a failure in terms of lack of personal ability, the same individual is likely to develop a negative reaction significantly higher than another who interprets the same setback in terms of external unlucky events or the difficulties of the task. Again, implicit theories refer to something more basic; the belief that a particular attribute is malleable or not may set the attribution for the success or failure of a performance with its subsequent setback.

Another conceptualisation that might be confused with Dweck's work comes from Ross (1989) who dealt with the implicit theory of stability and change. Although this concept appears to be similar to what was studied by Dweck, the real nature of the two constructs is quite different. In Ross's view, implicit theories are only related to the self and to memory of the past. As posited by James (1890), one of the main characteristics of the self is consistency across time. Indeed, the self is responsible for a sense of unity, as every individual does believe that he/she is the same person over time. However, sometimes individuals overestimate this sense of 'sameness' in the face of their actual change. Such people hold an implicit theory of stability. In contrast, other

individuals tend to overemphasise their actual change in the face of the stability of their self. These are implicit theorists of change. The way in which individuals conceptualise the malleability of the self affects their life stories and helps to display cultural differences in how behaviour is understood and processed, at a broad level. Past recollections are structured in order to preserve/alter perception of the stability of the self. The two theories are implicit because people do not really sense changes in the self because they occur so slowly. In conclusion, the main divergence from Dweck's theory on implicit theories is that Ross's construct is applied to memories and past histories in order to discover how the consistent/inconsistent perception of the self can affect identity, whereas implicit personality theories are expected to be predictors of future actions and plans. In other words, the implicit theories proposed by Dweck are boundaries which determine expectations about personal attributes, whilst implicit theories of the self are a flexible concept that people can change to shape and 'sell' their self to an audience as well as to themselves.

2.4 Implicit theories and motivation

Dweck (Dweck & Leggett, 1988) introduced the concept of implicit theory as a model for motivation and personality. However, she began to examine implicit theories in the domain of intelligence and only within academic contexts and schools. Since incremental theorists believe that intelligence is malleable, the brain is seen as a 'muscle' which becomes stronger with effort and exercises. For entity theorists, in contrast, intelligence is a gift and there is no way to vary the amount of what is received. From this perspective, if effort is needed to accomplish a target task, then the amount of intelligence owned is perceived as insufficient, and an entity theorist will abandon the challenge. In a series of experiments, a sample of 70 elementary school children (5th grade) solved a number of mathematics problems of varying difficulty. The cognition, affection and behaviour of every participant were assessed by questionnaires and

interviews. The aim of the research was to analyse the reactions and subsequent behaviour of participants when they faced difficult tasks. Indeed, the final four problems were too hard for their age, although the participants were debriefed about this detail only after they had finished the task. The findings revealed two different patterns shown by participants when facing failure; some children reported anxiety and a feeling of inadequacy. They tended to avoid the task, to cheat, or they started to speak about their ability in other fields. Their cognition about the difficult tasks implied a perception of personal lack of skill, memory and intelligence, even though just a few moments previously, the same participants had shown no discomfort at all when solving earlier problems. At the same time, another sub-group of children showed a completely different pattern. These children displayed a positive attitude toward the task and despite the hard work needed, they felt involved in a new challenge. This reaction was framed as an opportunity to learn new skills (Dweck & Repucci, 1973; Diener & Dweck, 1978). For this reason, they were considered to be 'mastery-oriented' children whereas the first group was named 'helpless'. Elliot and Dweck (1988) successfully provided evidence of a link between helpless children and performance goals, and between mastery-oriented children and learning goals. This implied that those children who were afraid to be judged tended to choose tasks to prove their ability in the attempt to avoid negative self-attributions. Seeking performance goals might produce a helpless pattern whereas attention towards learning goals was initially linked to mastery-oriented behaviour. Participants who believed that their attributes could be changed through effort and over time (incremental theorists) pursued learning goals, which fostered mastery-oriented behaviour. On the other hand, those participants who had a fixed point of view were interested in proving their ability and this helped them to avoid a negative (self-) evaluation. In the light of these results, it was argued that performance

was a source of Self-esteem for entity theorists whereas incremental theorists needed the acquisition of new skills to keep their self-evaluation high. Although the literature on Dweck's model is quite solid, only a few studies have clearly assessed the whole model considering goal orientation and implicit theories. For this reason, Stipek and Gralinski (1996) evaluated implicit theories, beliefs in effort and goal-orientation in a sample of children (N=316) attending 4th and 5th grade in an elementary school. They found partial support for Dweck's model; in fact, in their sample, incremental theorists were only poorly associated with mastery-oriented behaviour and a positive attitude toward effort. In that study, relationships between the variables considered were not causal. The authors concluded that holding an incremental point of view does not necessarily evoke more adaptation, that is, mastery-oriented behaviour. This leads to two implications. First, behind the two implicit theories there is not really a judgment or an attempt to indicate one way for a 'good' behaviour. Second, the study only established a mediational role of implicit theory on personality and it outlined that they operate through other variables, such as attitude toward effort.

More recently, Dweck and Mueller (1998) evaluated the consequences of praise for intelligence versus praise for effort. When the experimenter congratulated participants for the effort they had put into a task, the participants started to increase their motivation for solving the task, even though they needed to work harder. At the same time, praising their intelligence as an innate talent often implied attention to performances which eventually produced stress in those children seeking to show the intelligence owned. Thus, these subjects started avoiding those tasks which threatened the idea of them as talented individuals.

More recently, a longitudinal study (Blackwell, Trzesniewski, & Dweck, 2007) has provided further evidence for what was originally found in elementary grades. A sample of students (N=373) attending 7th grade at high school were followed across four years, during which their achievement in mathematics was observed. It was found that those

teenagers who had an incremental point of view were more likely to maintain a learning goal-seeking behaviour, which in turn fostered mastery behaviour. The study is relevant for several reasons. First, the importance and the role of implicit theories of intelligence were established in a longitudinal design. Consequently, as long as the same implicit theory about intelligence was sustained across years, the same adaptive (mastery-oriented) or maladaptive (helpless) behaviour was persistently displayed. Second, the study drew attention to a real-world task, that is to say, final marks in mathematics. Third, the study included an intervention programme as an implicit person theory manipulated through specific training sessions, showing that implicit person theories can be altered according to the aim of the experimenter.

2.4.1 Person cognition and moral judgment

The studies and results discussed so far have supported the idea that the perception of others might be influenced by Growth versus fixed Mindsets. Indeed, this is true even for conceptions about morality and stereotype formation and endorsement. As far as person cognition is concerned, entity theorists have appeared to subscribe to *lay dispositionism* more often than incremental theorists (Chiu et al., 1997). Lay dispositionism refers to the tendency to believe that behaviour reflects the basic traits possessed by a person. Lay dispositionism posits that the same traits can also be used to interpret behaviour across different situations (Chiu et al., 1997). Consistent with this idea, evaluative processes were studied in a sample of undergraduate students (N=125). Again, entity theorists tended to base their judgments on others' behaviour with broad traits, whereas incremental theorists looked at the same behaviours in a less evaluative manner; cultural factors, situational issues and external variables were taken into account to process the behaviour observed. This diversity in person

cognition reflected the difference in how information was understood (McConnell, 2001). Incremental theorists, in fact, needed more time to form an impression about others' personality, whereas entity theorists did not; a judgement based on early information was quickly available and easily retrieved in an encoded, coherent fashion (On-line based judgement). On the other hand, incremental theorists struggled to judge one person with respect to a single episode and they also tended to evaluate differently two situations even when the contextual factors did not actually differ (Memory-based judgement). This means that an impression was not encoded in a coherent and clear manner but was instead loosely organized around different pieces of information.

2.4.2 Conceptions about morality

Conceptions about morality and justice are expressed differently according to the implicit mindset considered. Entity theorists conceptualise justice by stressing duties (Miller, 1994) and punishment for antisocial behaviour (Dweck et al., 1995b; Chiu, Dweck, Tong, & Fu, 1997). Conversely, individuals with a growth mindset are focused on rights, and punishment is seldom the answer for immoral behaviour. In a study (Erdley & Dweck, 1993) with a sample of children at 5th grade, the authors presented a slideshow about John, a student just arrived in a new school. In one condition, the participants watched John consistently performing antisocial behaviours from the first moment to the last slide of the presentation. In the experimental condition, the final part of the slideshow was inconsistent with the beginning, that is to say, John started to be polite and well-mannered in the last few slides. In both cases, entity theorists produced a negative trait-related judgment; despite the fact that in the experimental condition John changed to prosocial behaviour, the entity theorists relied on the conception which they had already formed about him. Not only did they keep the same negative evaluation but they also did not expect any change in his personality. On the other hand, the incremental theorists did evaluate John's behaviour more positively because they were

greatly influenced by the final positive prosocial deeds which he performed. The same pattern emerged even if the behaviour observed at first was positive and desirable (Hong, 1994).

2.5 Stereotype formation and endorsement

As far as group perception is concerned, implicit theories appear to be relevant in many ways (Levy, Stroessner, Dweck, 1998; Levy & Dweck, 1999; McConnell, 2001; Plaks, Stroessner, Dweck, & Sherman, 2001; Plaks, Grant & Dweck 2005). Consistent with what had been found in a person's evaluation and cognition (Dweck et al., 1995) entity theorists quickly form an impression about a new group of people; with little behavioural information available, a strong and stable judgement is established for the whole group. Biological explanations are given to distinguish the individual from the rest of the general population. However, this does not automatically imply that they are not able to go beyond the information within the stereotype (Levy et al., 1998). In a series of experiments, Levy and colleagues studied the relationship between implicit mindsets and stereotype endorsement concerning cultures and ethnicities. Compared with entity theorists, those subscribing to the incremental point of view needed more time to fully develop a stereotype about particular groups because they pictured people in a more articulated fashion (Hong, Chiu, Yeung, & Tong, 1999).

As far as stereotype endorsement is concerned (Plaks et al., 2001), five different experiments were used to analyse attention allocation considering counter-stereotypic information. Compared with incremental theorists, entity theorists paid more attention to information consistent with their stereotype, whereas incremental theorists were more sensitive to those aspects which threatened the content of the stereotype. The authors interpreted these results in

terms of motivation; if a person holds a fixed point of view, any information which contradicts the stereotype is potentially dangerous and runs against the core idea of their basic belief that traits are stable.

2.6 Conflicts and interpersonal relationships

Research on intimate relationships has shown that conflicts are related to implicit theories of personality (Kammrath & Dweck, 2006). In two separate studies, researchers evaluated the correlation between strategies adopted to face a conflict and the mindset held by participants. Conflict-handling strategies were classified into two categories by Rusbult and colleagues (1982). One category comprises 'relationship maintaining' responses, such as 'voice' and 'loyalty': the former is an attempt to proactively find a solution with the partner (for example, discussion to find a common solution), whereas the latter refers to a quiet forgiveness which suspends the conflict. The other category comprises two conflict responses labelled 'relationship undermining' which includes 'exit', an active attempt to end the relationship, and 'neglect', which implies a passive acceptance with a subsequent feeling of discomfort about the quality of the relationship. Although several alternative explanations might justify the strategy chosen in a conflict, a clear pattern emerged; incremental theorists preferred to voice their problem with the partner, whereas entity theorists were more likely to engage in a passive response, such as loyalty or neglect.

More recently, Kammarath and Peetz (2012) investigated how implicit theories affect expectations between partners. The focus of their research concerned promises of change in personal attributes or any relevant behaviours for a target couple. Individuals with a strong incremental mindset perceived a failure of their partner to change as a lack of effort, with a consequent deterioration in the quality of their relationship, especially in terms of reciprocal trust. In contrast, an entity theorist did not expect change from his/her partner, thus any failure to achieve the change promised

was less distressful for the partner. In spite of the general idea that being close to an incremental individual might positively affect the social environment (Murphy & Dweck, 2010), that study highlighted a potential pitfall of being an incremental theorist.

2.7 Applied psychology and new directions

A number of studies have dealt with the application of implicit theories in various areas of psychology. Most of these contributions have not been organised into a systematic body of research, partly because they represent new venues in the field. However, a brief account of what has been done so far would help to analyse how the construct is understood beyond Dweck's perspective, and would explain how flexible and relevant the construct of implicit person theories became. Third, in the area of social and interpersonal psychology, new models stemmed from implicit theories.

2.7.1 Implicit theories at work

Few studies have analysed the relationship between management personnel and implicit person theories. In an attempt to evaluate the quality of management for a German company, Werth, Markel and Föster (2006) found that implicit theories are relevant as regards the assessment of the manager from the employee's perspective. Persons subscribing to an incremental person theory appraised their manager by considering multiple aspects and episodes, environmental factors and personal characteristics. On the other hand, entity theorists judged the managers' traits involved in the work place, thus confirming what was found in academic contexts. The study also considered implicit theories of personality held by managers. Managers with an entity point of view were judged more positively by employees, probably because, in turn, they

perceived employees' behaviour as more stable: this means that they did not continually ask for improvement or a faster pace of work and this in turn might reduce stress and pressure. In line with this finding, a second group of studies by Heslin and colleagues (2003; 2009; 2006) found that managers with an incremental point of view about others' personalities were more supportive and sensitive to changes in their employees' performance. Compared with entity theorists, incremental managers were also positive about the use of evaluation protocols during the life of the organisation, as they believed that personality and improvement at work are always possible, if the target employee strives for it. In a different longitudinal study (Heslin & VandeWalle, 2008), implicit theories were also manipulated with an intervention programme. Because the researchers believed that a growth mindset would lead to a highly-motivated performance, they taught an incremental perspective to a group of managers who in turn started to be purposeful about personnel organisation and evaluation. The results also provided evidence that after six weeks from the intervention, they still subscribed to the same implicit person theory.

2.7.2 Sport leisure and creativity

Only few studies have replicated findings from the academic domain in sports and physical activities. In a sample of undergraduate students in the US, Kasimatis and colleagues (1996) confirmed the relationship between Growth and Fixed mindsets and helpless/mastery-oriented behaviour. In another study, the same pattern was shown among adolescents (Biddle, Wang, Chatzisarantis, & Spray, 2003), who assessed incremental and entity theories using a tool specifically designed for sports science. They did change a critical aspect of the theory as originally developed by Dweck; in fact, they conceived implicit theories as a multidimensional construct. Six items were used to assess incremental theory, three related to the '*learning*' subscale and the other three to the other subscale, named '*improvement*'. Similarly, the entity measure included two

subscales, 'gift' and 'stable', three items each. Despite only three items being assessed in each subscale, reliability was acceptable with alpha .74 for entity subscales and .80 for incremental subscales, therefore suggesting that participants answered the questionnaire without any misunderstanding of its content. The two implicit theories were then conceptualised as separate and unrelated. The results showed that incremental theorists were associated with higher levels of 'enjoyment' as an indicator of a positive attitude towards sport, whereas strong support for an entity point of view was related to lack of motivation. Interestingly, these findings are consistent with what had been found by Dweck in academic achievement, although these later authors did measure the implicit theories as a multidimensional construct.

2.7.3 Other conceptualisations

Other conceptualisations of implicit theories have been developed recently. Although a deep analysis of the studies including these new formulations is outside the aim of the current review, it is worth describing the core assumptions yielded by later research.

In the area of interpersonal relationship, Knee and colleagues developed the concept of implicit beliefs about intimate relationships (Knee, 1998; Knee, Patrick, & Lonsbary, 2003). Individual differences are spelt out with respect to the length of a relationship. Some individuals believe that compatibility between partners is stable over time (the Destiny belief) and for this reason, obstacles and confrontations are perceived as a sign of non-compatibility. The length of a relationship is established by an implicit *a priori* assumption about the strength of the compatibility in the couple. Thus, the relationship is continually evaluated in terms of potential success and status. However, some people believe that obstacles might help to develop and reinforce a relationship.

These are called 'Growth' believers, who invest energy to challenge problems as they occur in everyday life.

More recently, in the field of social psychology, Tong and Chang (2008) derived the construct of the Group Entity belief (GEB) directly from implicit person theories (IPT). With this as a concept useful to detect individual differences, the authors claimed that people differ in the extent to which they believe that particular attributes are consistently associated with a group over time. This means that their social identity is perceived as an enduring aspect of their self. In contrast, those individuals low in GEB may feel that their identification within a target group may vary through time, although this does not give any information about the strength of this identification.

Even if these two formulations did both originate from Dweck's idea of implicit theories, they clearly diverge from it. Some other constructs, such as the implicit theories based on personal ability in sport, are greatly different from Dweck's original formulation as they measure a multidimensional construct. Coming to a conclusion, all these formulations reflect a focus on attitude towards change, although applied to different contexts. At the same time, it seems that they all share the idea that actual behavioural change lies in the eye of the perceiver. This may also be considered the most original contribution from Dweck towards the comprehension of individual differences.

2.8 Key questions and some critical issues

Some limitations need to be discussed before proceeding. First, after twenty years of research there are still some aspects that need further investigation, both on a concrete level and from a theoretical point of view. On a measurement level, implicit theories are quite problematic because a variety of strategies are used for their assessment. These strategies can be grouped into two different procedures. The first group includes a list of items based on a six-point Likert scale, with a final score

obtained by averaging the score from each sentence (see Cury, Elliot, Fonseca, & Moller, 2006; Dweck, Chiu, & Hong, 1995; Dweck & Leggett, 1988; Erdley & Dweck, 1993; Kammrath & Dweck, 2006; Levy et al., 1998). The second group uses an 'intervention protocol' in which the sample is divided into two sub-groups. One of these is exposed to a fictional scientific article supporting the idea that a target attribute (such as intelligence) is stable over time, whereas the other group is exposed to the opposite perspective, thus influencing the audience that intelligence is a malleable attribute that can be developed through time and effort (Bempechat, London, & Dweck, 1991; Blackwell et al., 2007; Heslin & VandeWalle, 2008; Nussbaum & Dweck, 2008). Both these types of measurement attempt to distinguish between incremental and entity theorists. However, the construct has been defined as a 'form of knowledge' and it has been specified that it is a unidimensional construct; thus, the protocol intervention yields two types that are inconsistent with the theory. Especially in studies published in the early 1990s, it was a common practice for data analysis to exclude 15% of the sample as these participants were categorised as not having a clear idea of the implicit theories subscribed. Even though this choice was made to simplify the communication of results, it should be noted that it is not the most appropriate practice. Moreover, sometimes the proportion of individuals rejected from data analysis in this way appeared to be arbitrary, although in more recent works this practice has been dismissed (Blackwell et al., 2007). From a theoretical point of view, one issue concerns the stability/instability of the mindsets measured. As already mentioned, in some works implicit theories were manipulated, but no studies addressed efficiently the issue of whether this intervention protocol has actually modified a pre-existing mindset or not. In a similar vein, no data about the stability of implicit theories are available apart from a few exceptions (Heslin & VandeWalle, 2008; Poon & Koehler, 2008).

A third issue concerns the nature of the domains explored by implicit theories. Most frequently, intelligence or morality were the subject of inquiry, and most studies used a sample of children or teenagers. This raises many issues; first it would be interesting to know how very abstract concepts such as implicit theories are processed and understood by these two populations. The concept of intelligence, for instance, is hardly defined even in the most notable psychology research, thus further investigations are necessary to explore what individuals think when they are interviewed on such a broad concept. This topic is particularly relevant if I consider that domains differ in their nature and may elicit a type of complexity that goes beyond the dichotomy between fixed and malleable. Second, each domain might have objective properties which are detached from individual perception and ultimately influence individual attitudes to them. For example, intelligence might be a more stable domain if compared with shyness or personality as a whole, and morality can be overall more flexible than personality.

Indeed, it is crucial to evaluate the role of implicit theories in actual personality and change. Although it has been claimed that holding the same implicit theory over time may drive personality change, only a few studies have directly addressed this issue (Robins, Nofhle, Trzesniewski, & Roberts, 2005; Spinath, Spinath, Riemann, & Angleitner, 2003). However, the results obtained show inconsistencies that need further investigation.

2.9 Research strategy and aims

As far as the implicit person theories are concerned, this current project seeks to explore the relationship between personality and implicit person theories, as theorised by Dweck (Dweck & Legget, 1988). Previous research in this field has not given a clear image of the influence that implicit beliefs might have on personality. This void of knowledge pushes towards a full comprehension of the impact of implicit theories beyond what is already acknowledged in motivation and academic achievement.

Specifically, some traits, such as Openness to Experience and Extroversion, are expected to be positively correlated with support for a growth mindset. This is because individuals with high scores on these traits are keen to frame reality in various ways (Openness) and tend to be actively involved in putting effort into it, a concept quite similar to what is expressed by the incremental theory. Following this idea, since incremental theorists can be seen as believers in personality change, subscription to the incremental point of view should also be positively related with higher levels of personality change. In addition to this, the association between implicit person theories and personality will also be explored from a person centred point of view. This means that personality is measured using a typological approach (Q-sort), in order to clearly identify whether specific groups of individuals might cluster together with any of the implicit theories reviewed. In this respect, no previous research allows me to formulate a clear directional hypothesis and this part of the project is explorative. Moreover, the Q-sort method employed for the identification of personality prototypes is still not part of the research mainstream, especially as regards its web based administration. Chapter 3 aims to discuss the Q-method, with particular attention to the web based application launched for the purposes of this study and now available to anyone interested in on-line data collection.

Chapter 3: The Q-sortware for personality assessment

3.1 Overview of the chapter

The Q-sort method is now a well-grounded technique in various fields and disciplines such as personality assessment, clinical psychology, economics, environmental sciences and policy making. The diversity of these applications focuses attention on how the technique is used. Indeed the current project seeks to apply the Q-sort method to the assessment of personality, which is only one of the possible applications. Under the label 'Q-sort method', in fact, different theoretical backgrounds have built up their own line of research, sometimes in contrast with one another. These views, however, share the use of Q-sort as a method to recover the centrality of the individual in research, which is a leading topic in the current project. In fact, the main aim of the current chapter is to introduce a new web application for the assessment of Q-sort online. This is because the majority of software for the administration of Q-sort is not updated or simply, they do not fit the needs of the current project. Given these premises, this chapter seeks to shed light on the main uses and schools of thought stemming from the original theory. Then a critical review of its advantages and disadvantages is presented. The chapter ends with a brief description of the Q-sortware, a web application that enables the administration of both Q-sort and Likert scale tests.

3.1.1. The Q-methodology: Origins and development.

The Q-methodology was first developed by William Stephenson (Stephenson, 1935) in order to focus attention on individual viewpoints in understanding behaviour (Stephenson, 1953). According to him, the psychological research of his time (for example, behaviorism) was too concentrated on the assessment of single variables or

stimuli in order to obtain *objective* measures of a behavioural response. In contrast, he conceived an empirical strategy to describe *subjective* viewpoints using a reliable procedure, that is, the Q-methodology. This novel technique enabled the collection of subjective impressions, personal attitudes, opinions, ideas and lay assumptions. The letter Q, however, only indicates an alternative to R-methodology, which pertains to the traditional analysis based on r correlations (rather than Q correlations, as discussed later in Chapter 5). The theory behind the Q-methodology, however, received less attention than Q-sort as a method for actual data collection, at least as far as psychology research is concerned. In this respect, Block (Block, 1971, 1961) promoted the use of the Q-methodology in order to obtain an objective description of personality through contextualised behaviours, in contrast with Stephenson's original idea (see Funder, 2012). In his most notable work *Lives through times* (1971), Block followed a sample of over one hundred individuals from childhood to young adulthood. Q-sort analysis yielded three personality prototypes (Resilient, Under-controlled and Over-controlled) which were consistently replicated over time. More recently, some studies have managed to replicate these prototypes in a German sample (Asendorpf & van Aken, 1999). Block's perspective on the use of Q-sort is an important opportunity to enrich the possible applications of this technique and therefore personality assessment would benefit from the use of prototypes in research. Another group of studies concerned clinical settings, in which Carl Rogers used Q-sort with his patients in order to obtain a measure for Ideal self and Self-discrepancy (Rogers & Dymond, 1954), thus showing another fruitful use of the Q-sort method. In conclusion, it seems that the novelty introduced by the Q-sort method goes beyond the theory behind it; probably its contribution lies in the acquisition of qualitative data through quantitative analysis. The best way to further explain this concept is to go through a detailed description of the method.

3.1 2 The Q-sort method explained

The Q-methodology works with a set of sentences written on cards which have to be sorted into piles. These sentences taken together constitute a Q-sort deck or Q-set. Decks may vary in terms of content and/or number of cards. To give a clear example, I shall describe the case of the AJQ, a Q-sort deck which is based on 43 adjectives (Aguilar, Kaiser, Murray, & Ozer, 1998). The list of adjectives represents trait/labels to be sorted into seven piles, ranging from 'Most characteristic' to 'Least characteristic' as shown in Figure 3.1. Each pile has a limited number of cards; for instance, only three adjectives can be sorted into the pile labeled 'Most characteristic', whereas ten cards have to be stored in the pile labeled 'Neutral'.

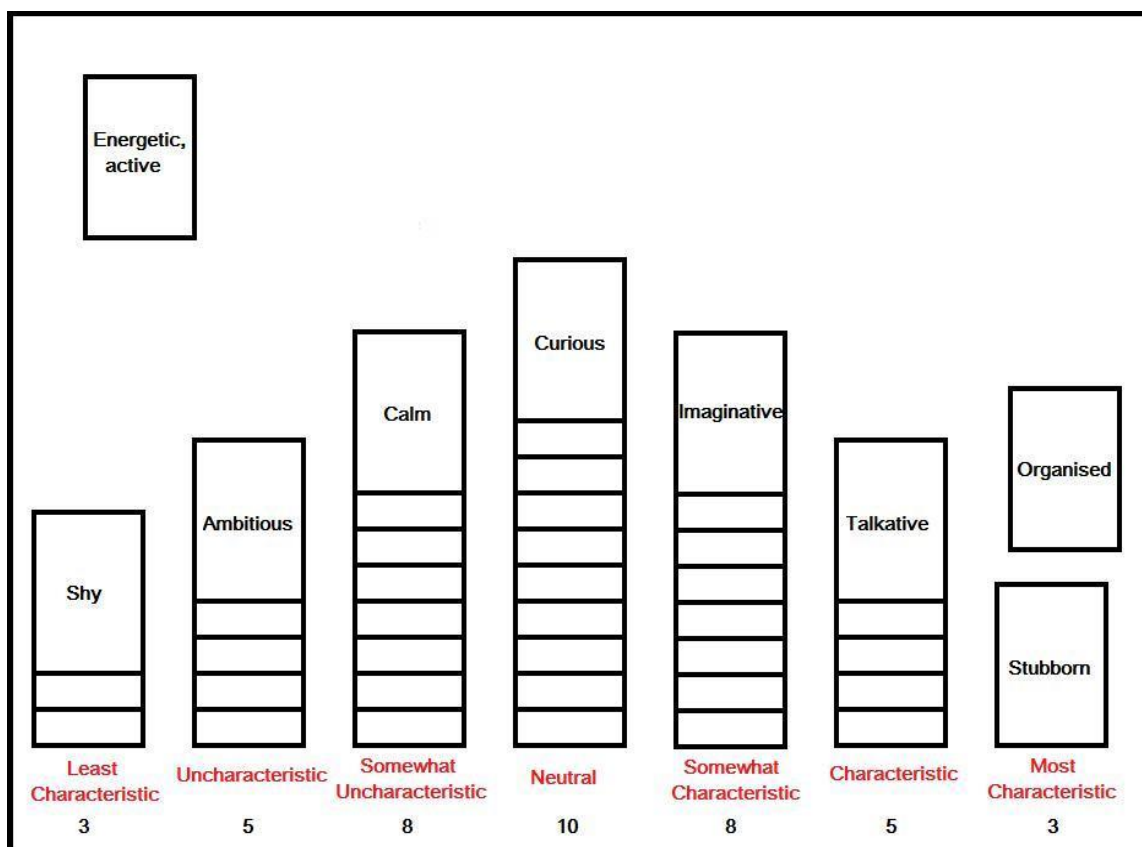


Figure 3.1: Example of a Q-sort. In this case the sort will be completed when the last two cards, 'Energetic, Active' and 'Organised', are stored in the 'Most characteristic' pile.

Once the sort is completed, scores are assigned to cards according to the pile in which they were listed; the three cards sorted into the 'Least characteristic' pile receive a

score of one, the five cards sorted into the 'Uncharacteristic' pile are scored two and so on. The task appears to entertain subjects, although sometimes the activity can be time-consuming. The CAQ (Block, 2008), for instance, contains 100 cards which need to be sorted into nine piles. When working with these rich decks, it is a good practice to carry out a preliminary sort in which participants read the cards and sort them into three piles ('Most characteristic', 'Neutral' and 'Least characteristic') without any numerical restriction. After this sort is complete, the final sort is less cumbersome.

3.1.3 A critical review of the method; advantages and disadvantages

As already discussed in Chapter 1, the Q-sort method is a successful attempt to put the individual at the centre of the analysis (Block, 2008) by using a person centred approach. Ozer (1993a) described the contribution of the Q-sort method as follows: "When describing my accountant to my neighbor during a poolside conversation, I hardly refer to Likert scales, but instead provide a character sketch, noting those attributes of the other that are most salient, most unusual, most characteristic, most differentiating" (p.1). Such a character sketch is fully individuated, created only for the purpose of describing a single individual.

A second advantage of the Q-sort lies in its fixed distribution. In contrast with standard self-reports based on Likert scales, a fixed distribution ensures that participants carefully consider which trait is assigned to a category; in this manner a number of common issues in the completion of questionnaires are strongly reduced if not completely solved, such as the response set of the middle or the extreme values of the range of possible answers (for example, persistently choosing a 4 in a scale from 0 to 7). In a similar vein, the fixed distribution limits the preferential use of extreme values (for example, values of 0 and 7 on a 0–7 scale). Other issues, such as social desirability and the tendency to agree with the content of a card or item (acquiescence), are attenuated by Q-sorts because the forced distribution implies that individuals have to

make a decision considering several times the whole set of cards to be sorted. As a consequence, participants carefully choose how they want to depict themselves with a fixed number of traits/labels by filling each pile/category. Parents, peers, teachers, clinicians and any other relevant informants from different contexts are often chosen as external raters (See for example Funder & Colvin, 1988; Funder & Dobroth, 1987); indeed, relevant others can be a unique source of information about a target participant.

So the Q-sort method achieves great flexibility by enabling a shift from a variable centred approach to a person centred approach (see section 1.4.1). This is because Q-sort can be analysed using both a factor analysis and the so-called 'inverted factor analysis' or 'Q-sort factor analysis' (Asendorpf & van Aken, 1999). The former is traditionally used in a variable centred approach in order to spell out those factors that can be then correlated with other variables of interest. Since a Q-sort is not organised around pre-determined factors, data analysis yields factors that can be arranged as separate questionnaires. The latter is meant to be a factor analysis based on the person rather than on variables; this means that the initial correlation matrix is transposed prior to the actual analysis. The matrix thus shows the similarities and dissimilarities between the participants included in the sample. The output is constituted by a number of factors which are interpreted as personality prototypes. In Chapter 5, further details will be given to describe more fully the whole procedure. Here, it is worth noting that the word 'prototype' expresses a group of concrete individuals sharing a configuration of behaviours that make them unique and distinguishable from others, and it is far different from being a rigid categorisation as suggested by the traditional use of the term 'prototype' (Funder, 2007).

Despite the several advantages pointed out so far, the Q-sort is not the only method with the characteristics described above, nor is it without its shortcomings (Ozer, 1993a).

The first caveat concerns the validity of data for Q-sort items when Q-sort is employed to describe peers. Even if this is also carried out using Likert scale tests, the evaluation of validity when different judges have to describe the same individual can be rather troublesome. Usually, agreement between judges is a good criterion but it is not sufficient if each judge describes a person from his/her own perspective. For instance, consider the case of a child described by a parent (the home context) and by a close friend (for example, at school). This implies that even generalisation over judges is necessary to assess the validity of Q-sort data. Block (1980) provided clear guidance to check the validity of Q-sort data by considering judges' correlations. However, this issue does not affect reliability because even if the inter-judge agreement might be low, the reliability might still be very high.

A second issue is the time needed for the administration of Q-sort. Some decks can contain over 100 cards, organised around several piles (see the CAQ, Block, 2008). Also, the cards themselves can contain a description of a situation in which a given behaviour is portrayed, that is, they are descriptors (Funder, 2007). So the completion of the paper version of a Q-sort can be time consuming especially because of the fixed distribution (Barry & Proops, 1999; ten Klooster, Visser, & de Jong, 2008). This is presumably one reason that might exhaust participants' attention after completing a Q-sort. Moreover, a test retest section is often required in longitudinal studies assessing personality change in order to obtain a coefficient of the 'noise' in the data. In practical terms, these issues might prevent the use of the Q-sort method. It is the current writer's belief that the implementation of a computer based administration is the best solution to maximise the advantages of a Q-sort procedure.

3.1.4 Paper and pencil versus computer-based and on-line procedures

The use of computers and web applications in psychology research is now a common practice (Ramo, Hall, & Prochaska, 2011; Wang, Jiao, Young, Brooks, &

Olson, 2008) because they offer several advantages; computer based procedures are easily tailored to specific demands and at the same time they are generally cost-effective (Birnbaum, 2004). Evidence of the equivalence between the different media (that is, paper and pencil, web and off line computer applications) has been effectively provided even for personality psychology (see for example Meade, Michels, & Lautenschlager, 2007). Additionally, given the rapid increase in computers and internet usage, sample size and its representativeness of the generality of the population is no longer an issue; on the contrary, web based data collection is a good opportunity to reach a wide variety of individuals who are traditionally underrepresented when paper and pencil procedures are used (Henrich, Heine, & Norenzayan, 2010). In particular, the time needed for the administration of individual questionnaires and for gathering a given sample is sharply reduced. For these reasons, the current project takes advantage of a computer based procedure, especially because a web application allows the administration of tests with different methodologies, such as Q-sorts and Likert scale tests.

3.1.4.1 Q-sort method on line.

The rapid development and diffusion of web applications make it really difficult to classify all the software currently available for the on line administration of Q-sort and Likert scale tests. Some of them do allow the use of Q-sort online but often they do not seem to be updated with respect to the latest operating systems and machines (ten Klooster et al., 2008); sometimes they can only be used with specific Q-sets. Of these, only a few softwares have been approved for use by the scientific community through proper validation studies. The Q-assessor, for example, (Reber, Kaufman, & Cropp, 2000) appears to be the one with the most user-friendly interface and with a version that can be used with any electronic devices, such as smartphones, computers and laptops. A beta testing of the tool is available free and further options are activated by paid subscription. Unlike many other applications, the tool offers a customer service, the

opportunity to work with other response formats and a policy for data protection. Despite these positive aspects, the Q-Assessor does show some theoretical rigidity which makes it a viable option only for qualitative analysis, strictly in line with Stephenson's initial perspective on the Q-methodology (Stephenson, 1953). The university of California, Riverside offers the opportunity to download a web application that enable the administration of Q-sort off line (go to <http://rap.ucr.edu/qsorter/> for more information about it). The web application is called 'Q-sorter program' and it is regularly updated and improved. Also, this application is updated and it is free from any costs; however, it allows the administration of Q-sort only and therefore it is unsuitable for the purposes of this project, in which several tests with different response format are included in a single procedure. Similarly the 'WebQ', a web application that can be found at <http://schmolck.userweb.mwn.de/qmethod/webq/>, allows the administration of Q-sort only. Indeed, the creation of a Q-set requires specific knowledge of Java script and a number of files need to be edited for the Q-set to be ready for the administration. Moreover, the User Interface (UI) is not user-friendly and it does not reproduce the paper version of the Q-sort. This detail is essential when no published scientific papers are available to guarantee the reliability of the tool. A complete and exhaustive evaluation of the tools currently available falls out the purposes of the current study; to date, the costs, flexibility and availability of the solutions have encouraged the development of a new project for an application easily available to everyone and completely free of any costs, for both participants and experimenters. In particular it is necessary to develop an application which allows the administration of tests with different response format and is suitable for longitudinal research.

3.2 The Q-sortware

The Q-sortware allows the administration of both Q-sort and self-reports. It is entirely free and accounts can be requested at <http://www.qsoftware.com/>. Each feature

included is thought to enhance flexibility in the use of the Q-sort method for both quantitative and qualitative research. The main intention is to support both researchers and participants towards a quick completion of questionnaires, thereby maximising the advantages from the use of computer based procedures. With respect to the variety of theories associated with the Q-sort method, the current software attempts to offer a number of options that are equally essential, regardless of the theory held by a researcher. It is nonetheless acknowledged that other software packages currently available may be an alternative to the Q-software. In the following paragraphs, the main features of the software are explained.

3.2.1. Technical details

The Q-software has been developed in python (<http://www.python.org/>) with the support of Django and ExtJS frameworks. As far as privacy is concerned, data are stored in a Django server and daily back-up is performed for safety reasons. The software can create three types of account, temporary, standard and super. Temporary users are allowed to use the software for thirty days, after which access is denied and permission to use the software has to be renewed. After one month, the data collected are still in the server, unless otherwise requested by the experimenter. A standard user is similar to a temporary user but can use the account with no time limitation; finally the super-user creates accounts for future Q-software customers and therefore this option has been created only for administrative purposes. Additionally, each standard or temporary user is uniquely identified by a user name and a password delivered to the owner of the web address. The website also offers a customer service that can be contacted by email at info@qsoftware.com.

The software also enables both passive and active recruitment. The former means that the procedure is posted on a web page linked to the account of the

experimenter, whereas active recruitment is achieved by the use of a mailing list available from the main menu of each account.

3.2.1.1. Main menu

In order to receive a username and a password, prospective users have to send an email to account@qsoftware.com. Then the username and password have to be inserted at <http://application.qsoftware.com/admin/>. Once logged in, a new web page shows four sub-menus; 'Invite participants', 'Settings', 'Submission' and 'Log out (see Figure 3.1).

3.2.1.2. Managing a procedure.

The Setting sub-menu lists a number of options; procedures can be created, edited or cancelled ('Add procedure', 'Edit procedure' and 'Cancel procedure' buttons, respectively). In this menu, procedures already created can be further divided into two groups, 'Public' or 'Disabled'. The former makes the procedure available for the generality of the population (passive recruitment). This means that by visiting the web address at <http://application.qsoftware.com/> anyone can complete the set of questionnaires posted. The 'Disabled' button hides the procedure from the web page. If neither of these options is selected, the procedure is active and private. This means that the administrator is allowed to invite participants by email, therefore using an active recruitment strategy (Birnbaum, 2004). Once the 'Add procedure' button is selected, a caption and a name must be inserted. The name of the procedure will be displayed by the administrator, whilst the caption will be seen by the participants, whether a public or a private mode is chosen. When a new page is opened, administrators are able to create, edit and cancel questionnaires. If any participants have completed the procedure, these buttons are no longer available because the software has locked any further editing. It is a good practice to copy the procedure so as to preserve an editable version. By using to the option 'Add to favourites', the experimenter can easily recall the

whole set of questionnaires, direction boxes and other settings. Tests and items previously saved can be also cloned. These features are particularly useful for test retest sections and longitudinal designs.

Once the sub-menu 'Add a questionnaire' is selected, several options are available: direction boxes (splash screen), Likert scale test, Q-sort and input screen, which allows the researcher to use a variety of response formats ranging from open questions to dichotomous items and drop-down menus. Given the scope of this current study, a detailed description of the Q-sort creation follows.

3.2.1.3. The creation of a Q-sort

The menu for a new questionnaire, whether the creation of a Q-sort or a self-report test is involved, is split into two parts (see Figure 3.2). On the left, the administrator can add or remove boxes. Each box should be labelled (for example, 'Most characteristic' and so on) and then ordered according to the choice of the experimenter. The first box will be displayed at the top left of the screen during sorting (see Figure 3.2). The experimenter must set the maximum number of items for each box so as to fix the distribution. Then a score for each box must be set. The experimenter is also allowed to assign the property of the 'initial box' to a chosen number of boxes. If this option is activated, the administration of the Q-sort is split into two parts. The first of these is the initial sorting. This means that the subject will first distribute the list of labels into any of the initial boxes, without any restriction on the number of labels for each box. When the first sort is complete, a second screen encourages the participant to refine his/her initial sort.

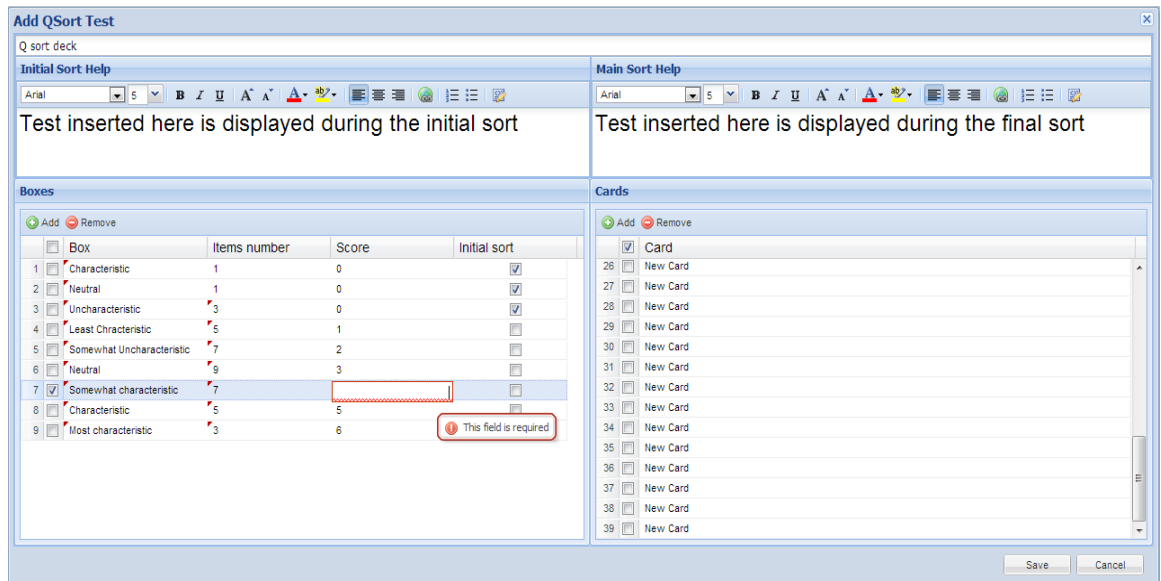


Figure 3.2. Editing box for the creation of a Q-sort.

During the second sorting, participants are still able to make changes to their initial sort, as the software allows them to drag and drop any label into any box, on condition that the fixed distribution is respected. This two-step administration is particularly useful with very long versions of Q-sort, such as the CAQ (Block, 2008). Only when the subject has completed the second sort does an 'OK' button appear. Once this is pressed, data are submitted and no further changes are possible. At the completion of the whole procedure an email is requested. By inserting the email, the procedure is then saved and the data are stored into the server.

3.2.1.4. Data insertion

In the 'Submission' icon, the protocols submitted are displayed. For each procedure there is the list of the participants who submitted data. Each of them is linked to a specific email, date and total time needed for the completion of questionnaires. This information can be useful in order to check invalid protocols (Johnson, 2005). It is reasonable to believe that protocols submitted over many hours are coming from non-motivated individuals; for the same reason, according to the number of questionnaires delivered, the researcher might establish a time threshold beyond which the protocol will

be rejected. In this menu, each subject's response can be displayed in two ways. The first uses pictures (for example, see Figure 3.3 for the picture of a Q-sort). By selecting one protocol, the experimenter displays the list of answers from each participant, organised by questionnaire. Alternatively, the software creates a .csv file. In this way, any number of protocols can be downloaded and directly uploaded into any software for data analysis, as this format is widely recognised by any statistics software (such as R, Exel and IBM SPSS).

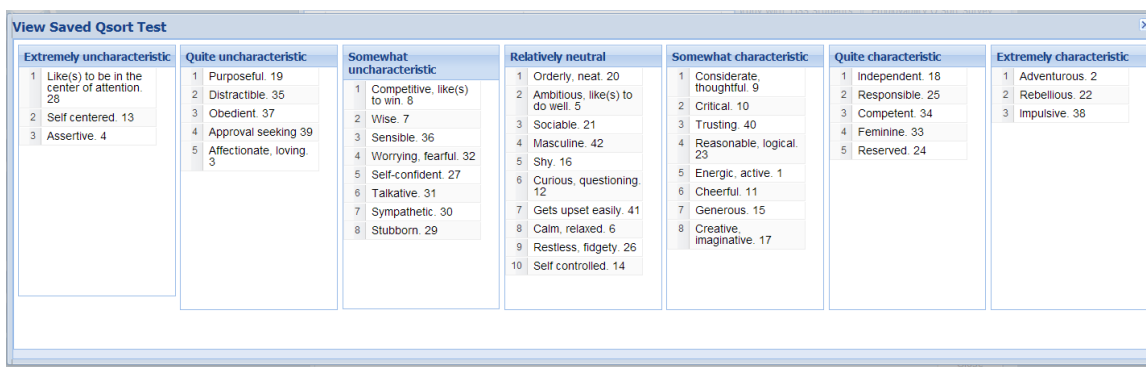


Figure 3.3: Q-sort completed by a participant

3.3 Conclusion

The main scope of this chapter was to present the potential offered by the Q-sort method, with attention to non-paper and pencil questionnaire administration. In particular, the Q-sortware is proposed to be an ideal alternative for the management of on line data collection, where Q-sort and other tests with a different response format are part of the same procedure. The Q-methodology is able to recover the centrality of an individual in personality research, although the time needed for the administration of Q-sort appears to be an important shortcoming within the paper version of the test. In contrast, the flexibility achieved in a computer based administration enhances the opportunities to manipulate variables more than in a traditional setting, and the time

needed for the completion of a single protocol is sharply reduced. With respect to the Q-sort, it has been noted that the majority of the applications available show a number of restrictions (for example, limited response format and cost) which encouraged the creation of a new, free software which enables the administration of a Q-sort and a Likert scale test in the same procedure. This is the case of the Q-sortware. It is nonetheless recommended to make a preliminary validation of the questionnaire employed in order to make sure that specific choices in items presented do not affect subjects' responses (Henning, 2004; Meade et al., 2007). This validation is the main aim of the next Chapter.

3.3.1. Next steps

Given the theory and the methodological considerations discussed so far, the current project is organised around three main themes. The first deals with personality and personality change in a sample of emerging adults, with a focus on a multi-perspective approach to personality (Asendorpf, 2009) in which a variable centred and a person centred approach are used together for a complete description of an individual. The second theme deals with implicit person theories (Dweck, 2000; Dweck & Leggett, 1988) and their association with actual traits and personality change in order to clarify what the actual impact of implicit person theories is on personality. The third theme is the on line administration of a personality test with a close look at Q-sortware, a new web application supporting both self-report and Q-sort. This latter theme is actually at the core of the next empirical chapter, in which a validation of the Q-sortware is achieved. Additionally, the next chapter seeks to explore the feasibility of some aspects related to the other two themes, and these are discussed more fully in Chapters 5 and 6.

Chapter 4: Empirical evidence for the validity and reliability of the Q-software

4.1 Introduction

As already discussed in Chapter 1 (see section 1.4.1.2), over the last few decades the study of personality has been characterised by a strong emphasis on a variable centred approach (that is, traits as assessed by the FFM). However, isolated traits do not take account of real individuals as they represent abstract concepts only ultimately linked to the average person (Asendorpf, 2009). In the light of these considerations and in line with renewed interest in a person centred perspective. In this work a multi-perspective approach to the study of personality is adopted. At a methodological level, this framework requires the employment of questionnaires which go beyond what is traditionally investigated with the FFM (Block, 2010; McAdams, 1995; McAdams & Olson, 2009). The Q-sort method, for instance (Block, 1971, 2008), is an appropriate technique for these purposes because it allows a quantitative analysis within a person centred approach (see section 3.1.1). However, the paper and pencil modality of administration is time-consuming and potentially cumbersome, especially when a Q-sort with several descriptors is used (Barry & Proops, 1999; ten Klooster et al., 2008). The need for efficiency was the starting point for the creation of the Q-software, which enables the administration of procedures with both Q-sort and Likert scale questionnaires. Indeed, previous software appeared to be out-of-date or more appropriate for qualitative analysis. The use of a web based procedure reduces costs and time necessary for the administration, particularly when different methodologies are used within the same research design (Turner, Ku, Rogers, Lindberg, Pleck, & Sonenstein, 1998). Despite these advantages, it should be never taken for granted that paper based and computer based versions will produce identical results (Meade et al.,

2007; Wang et al., 2008). This is particularly true when non-frequent personality measures are adopted, as with the Q-sort method. Software currently available does vary in terms of graphics and guidelines; in this respect, the Q-software reproduces every single aspect of a paper based Q-sort deck, as has already been shown in Chapter 3 (see section 3.10).

4.2 Aims and hypotheses

Given these premises, this study seeks to investigate the equivalence between the paper version of the Q-sort and the on line version offered by the Q-software. For this purpose, reliability (that is, test retest) and a completion of the Q-sort by peers are considered. The former information is essential because it provides evidence that the medium used does not affect the reliability of the instrument, since the reliability of Q-sort has sometimes been questioned (Ozer, 1993b), whereas the latter tests an important feature of the Q-sort, which can strongly benefit from an on line administration. In fact, the Q-sort method is often employed to obtain descriptions from peers or relevant others (see for example Funder & Colvin, 1988; Markey, Markey, Ericksen, & Tinsley, 2006) and from clinical contexts (Block, 2008, 1961). On line peer description would benefit both efficiency and time, since it is often easier to contact a friend on line rather than require him or her to be physically in a given place for an experiment.

Together with these purposes, this study also seeks to explore the feasibility of some hypotheses introduced in Chapter 1 and Chapter 2 concerning the association between personality traits and implicit person theories (first level of analysis, as suggested by McAdams⁷ (1995)), and between them Self-esteem and Self-discrepancy and general well-being (that is, Life satisfaction), for a second level of analysis which should include personal concerns. Indeed, research on implicit person theories underpinned the idea that holding an incremental person theory is somewhat desirable

⁷ See section 1.4.1.3 for a review of the levels of analysis suggested by McAdams.

and preferable in terms of academic achievement (Blackwell et al., 2007) and intimate relationships (Kammrath & Dweck, 2006). However, according to the original formulation of the theory, incremental and entity person theories should be equally desirable (Dweck et al., 1995; Dweck & Leggett, 1988). In order to explore this issue empirically, the association between implicit person theories and life satisfaction will be explored. In line with the evidence reviewed so far, higher levels of Life satisfaction are expected to be associated with the support of an incremental point of view of personality, thus suggesting that holding an incremental person theory does impact on personal well-being.

4.2.1. Implicit person theories and personality traits

As far as a variable centred approach is concerned, previous studies have shown that marginally significant correlations are found between implicit person theories and the traits Openness to Experience, Extroversion and Conscientiousness (Spinath et al., 2003). Although those authors concluded that personality traits and implicit theories of personality are largely unrelated, a number of issues concerning the tool used for the assessment of implicit person theories has suggested that these results are not definitive (see sections 2.8 and 2.8.1 in Chapter 2). Indeed, it is entirely plausible that higher scores on Extroversion, Conscientiousness and Openness to Experience can be positively associated with the endorsement of an incremental theory of personality. Past evidence (Zweig & Webster, 2004) showed that these traits are positively correlated with a learning goal orientation, that is, a focus on the opportunity to learn new skills when approaching a new task or a challenge, which is in turn a feature associated with an incremental theory of personality (Blackwell et al., 2007; Elliott & Dweck, 1988). In addition, I also agree with Angleitner (Ostendorf & Angleitner, 1994; Spinath et al., 2003) that Openness to Experience resembles some aspects subscribed by incremental theorists, that is, using multiple sources of information in order to process information

and others' behaviour with flexible judgments (Chiu et al., 1997; Norenzayan, Choi, & Nisbett, 2002). To summarize;

H1: It is expected that there is a positive association between Extroversion, Conscientiousness, and support for an incremental theory, and between Openness to Experience and the support for an incremental theory.

4.2.2. Implicit person theories, self-concepts and general well-being

As discussed in Chapter 2, implicit person theories are conceived to be a form of knowledge (see section 2.2, Chapter 2) with regard to personal attributes. For this reason, the relationship between Self-esteem and implicit person theories and between Self-discrepancy and implicit person theories appear to be an essential part of understanding the nature of this construct and it is part of my attempt to study personality beyond personality traits. Previous studies on the topic have suggested that the two theories are independent (Dweck et al., 1995) Indeed, Dweck argued that incremental and entity theorists have different sources for their Self-esteem (Nussbaum & Dweck, 2008). Entity theorists source their Self-esteem from the actual outcomes of their performances. If the outcome is valued, such as a high mark in a mathematics test, Self-esteem is increased with respect to the personal attribute relevant for that task, that is, intelligence. Conversely, if the score in the same mathematics test is particularly low, or if strong effort is required to succeed in a given task, Self-esteem is weakened, since entity theorists believe that the amount of intelligence which they have is not enough for a good performance and it cannot be changed.

Recent findings on this subject, however, have suggested a different framework; as previously noted, it has been shown (Renaud & McConnell, 2007) that support for an entity theory has moderated the relationship between Self-discrepancy and Self-esteem, with two separate measures of Self-discrepancy, one based on a variable centred

approach and the other reflecting a person centred perspective. The results have shown that when scores on Self-discrepancy are higher, Self-esteem is low, especially when a target person holds a Fixed mindset about his/her personality. Moreover, at least in the domain of intelligence, implicit theories have been shown to be directly related to Self-esteem and collective Self-esteem in a representative sample in the Philippines (King, 2012). In the same study, it was also argued that holding an incremental theory was positively associated with a number of desirable outcomes, including positive affect, harmony in intimate relationships as well as Life satisfaction. In particular, Life satisfaction is a general indicator of well-being, which is informative about the quality of life of individuals. These results are particularly plausible when implicit theories are applied to the domain of personality, but empirical evidence is still necessary because implicit theories are domain-specific and therefore it cannot be taken for granted that the results in the domain of intelligence just mentioned are extended to other domains (Dweck et al., 1995, 1995). If these results can be confirmed, what was formerly claimed by Dweck needs to be reconsidered in the light of the fact that holding an incremental point of view is desirable in itself for the individual, while holding an entity point of view leads to maladjustment in any case. In conclusion, the following hypotheses are formulated:

H2: An incremental person theory is positively associated with scores on Self-esteem and Life satisfaction.

H3: It is expected that implicit person theories moderate a negative relationship between Self-discrepancy and Self-esteem.

4.3 Method

4.3.1. Participants

Fifty-two participants were recruited at the University of York (age $M=25$, $SD=6.47$, age range 17 - 48 years old, 23 males). An independent t test showed that neither age $t(50)=-.98$, $p<.33$ nor gender $t(50)= -1.89$, $p<.07$ were significantly related to any specific implicit theory, although there was a tendency of females towards support for the incremental theory ($M=.29$, $SD=.94$, males were $M=-.22$, $SD=1.00$, standardised scores are used), as already shown (see for example, Dweck & Leggett, 1988; Kammrath & Dweck, 2006).

4.3.2. Measures

Personality: Adjective Q-sort (AJQ). A Q-sort version for non-professional sorters (Aguilar et al., 1998; Block, 2008) served as a measure of personality. This version of Q-sort is relatively short and can be easily completed on line by participants as in a self-report. This Q-sort is based on a list of 42 adjectives that have to be grouped into three piles for the initial sort; boxes were named 'Most characteristic', 'Neutral' and 'Least characteristic'. When this stage was completed, the participants were invited to refine their sort using seven piles, as shown in Figure 3.3, Chapter 3. Each pile had to be filled with a fixed number of adjectives as follows: 'Least uncharacteristic' (3 adjectives), 'Quite uncharacteristic' (5 adjectives) 'Somewhat uncharacteristic' (8 adjectives) 'Relatively neutral' (10 adjectives) 'Somewhat characteristic' (8 adjectives) 'Quite characteristic' (5 adjectives) and 'Extremely characteristic' (3 adjectives). The adjectives received a score based on the box assigned, ranging from 1 ('Least characteristic') to 7 ('Most characteristic'). See Appendix A for the full list of adjectives included in this deck.

Big Five Personality Inventory (BFI). This is a rather popular inventory for personality traits based on 44 items (John & Srivastava, 1999). The response set was based on a five-point Likert scale ranging from 1 'Disagree strongly' to 5 'Agree strongly'.

In each sub-scale, some items were reversed, then the scores were averaged. Sub-scales included 8 items for 'Extroversion' and 'Neuroticism', 9 items for 'Agreeableness' and 'Conscientiousness' and 10 items for 'Openness to Experience'. Alpha reliability coefficients were .81 for Extroversion, .75 for Agreeableness, .76 for Conscientiousness and .82 for Openness to Experience.

Self-esteem: *Rosenberg Self-esteem scale (RSE)*. Ten items provided a one-dimensional measure of Self-esteem (Rosenberg, 1965), based on a four-point Likert scale ranging from 1 'Strongly agree' to 4 'strongly disagree'. Items 3, 8, 9 and 10 were reversed. Scores were finally averaged. Alpha reliability was .81

Life satisfaction: *Brief Multidimensional Students' Life Satisfaction Scale (BMSLSS)*. Six items (Seligson, Huebner, & Valois, 2003) measured life satisfaction based on students' everyday life, with an 8 point Likert scale ranging from 1 'Terrible' to 8 'Delighted'. Each point of the scale represented a different level of satisfaction within family, friendships, school, self, place and life. Scores were averaged. Alpha reliability was .70

Implicit theories. Eight items measured implicit theories (Dweck & Leggett, 1988), four from an entity point of view. The full list of items can be found in Appendix B. Participants were asked to express their agreement/disagreement with each sentence, using a six-point Likert scale ranging from 1 'Strongly disagree' to 6 'Strongly agree'. Because implicit theories are here considered to be a one-dimensional measure, entity items were reversed and then averaged with incremental items, so that higher scores represented stronger support for an incremental point of view (Levy et al., 1998). Taken separately, the averaged scores based on the two implicit theories showed a high negative correlation ($-.85, p < .0001$), thus confirming that subscribing to an entity theory implies the rejection of the incremental theory. Alpha Cronbach for internal reliability was .95

Self-discrepancy: A person centred measure of Self-discrepancy was obtained following Rogers' model (Pavot, Fujita, & Diener, 1997; Rogers & Dymond, 1954) through the AJQ. Participants were asked to sort the list of 42 adjectives a second time. The first description was used for the actual personality, but the second time participants sorted the same Q-sort deck again, they were given slightly different instructions. For the second sort, they were invited to do the sort thinking about their ideal set of personal characteristics, that is, the person that they would like to be. Therefore, the three boxes used for the initial sort were labelled as 'Most desirable', 'Neutral' and 'Least desirable'. Again, the second sort included seven boxes, ranging from 1 'Least desirable' to 7 'Most desirable'. To obtain the measure of Self-discrepancy, a correlation based on a transposed matrix was computed between the adjectives as sorted in the actual self and the ideal self-sorting. Scores were then standardised.

4.3.3. Procedure

The sample was recruited via an electronic booking system offered by the University of York after receiving ethical approval from the Department of Psychology. Participants went to a computer laboratory and completed the whole on line procedure there. The experimenter asked each subject to nominate a peer willing to describe him/her accurately. For those peers who agreed to take part in the experiment, an email was sent via the Q-sortware, with directions and a link to the actual procedure. This means that peers completed the procedure on line and never met the experimenter in person. After two weeks, another email was sent to each participant, with a link to the retest section. Of the initial 52 participants, 40 submitted the retest procedure after two weeks and 37 peers described their friends. The sum of £5 was given to each participant to thank them for their contribution. Data submitted were downloaded from the Q-sortware into a *.txt file and then directly uploaded into PASW/SPSS v.20 for subsequent analysis.

4.4. Results

4.4.1. The Q-sortware

After checking the normal distribution for each adjective included in the AJQ (Tabachnick & Fidell, 2007), the reliability of the Q-sort was tested using test re-test coefficients based on individual responses. This means that the data matrix was first transposed and then individual answers were correlated to those given at the retest section, thus representing correlations between individuals, or Q-correlation. The results of the Q-sort ($M=.79$, $SD=.08$) and the measure of Self-discrepancy based on the Q-sort ($M=.82$, $SD=.08$) were satisfactory. With regards to self/other agreement, a zero order correlation was computed considering the individual responses from the peer's description and the subject's self-description, with $M=.47$, $SD=.03$. Tables 4.1, 4.1a and Tables 4.2/4.2a show that the level of agreement varied considerably from item to item. Each table compares the sample recruited here with two samples taken from separate studies in which a peer description was provided (Funder & Colvin, 1988) in order to show the equivalence between the paper version of the Q-sort and data obtained with the Q-sortware. Although the Q-sort used here was based on 42 descriptors whereas Funder and Colvin used 100 cards from the CAQ (Block, 2008), it is possible to identify a number of correspondences between descriptors with high inter-judge agreement. Previous studies using a paper version of the California Adults Q set, (CAQ) (Funder & Colvin, 1988; Funder & Drobth, 1987) found that the more a behaviour is easily observable, the higher is the agreement between the self-other reports on personality description. Indeed, although the tables refer to two different samples, the AJQ provided similar results in terms of self-other agreement when compared with the descriptors offered by the CAQ: 'Talkative', 'Cheerful' and 'Rebellious' resembled what is implied by 'Is cheerful', 'Is a talkative individual' and 'Rebellious and nonconforming' respectively. Similarly, 'Sensible, wise', 'Competitive, likes to win' and 'Worrying, fearful' showed lower levels of self-other agreement.

Table 4.1

Comparisons between descriptors from Funder's study and our sample.

Most agreement Descriptors (CAQ)	Self/other agreement		Descriptors (AJQ)
	(CAQ)	(AJQ)	
Is concerned with philosophical problems	.50***	.29	Considerate, thoughtful
Is cheerful	.43***	.37*	Cheerful
Regards self as physically attractive	.43***		
Tends to arise liking and acceptance	.41***		
Behave in an assertive fashion	.40***	.19	Assertive
Is a talkative individual	.40***	.50**	Talkative
Interested in opposite sex	.40***		
Rebellious and nonconforming	.40***	.38*	Rebellious
Is calm, relaxed	.39***	.46**	Calm, relaxed
Turned to for advice and reassurance	.38***		
Is power oriented	.37***	.23	Energetic, active
Physically attractive	.36***		
Values intellectual matters	.36***	.19	Reasonable, logical
Enjoys aesthetic impressions	.36***	.41*	Creative, imaginative
Initiates humour	.36***		

Note. Funder's coefficients were based on two samples (n=41; n=64). Current sample, n=36.
*p<.05, **p<.01, ***p<.001.

Table 4.1a

Comparisons between descriptors from Funder's study and our sample.

Least agreement Descriptors (CAQ)	Self/other agreement		Descriptors (AJQ)
	(CAQ)	(AJQ)	
Engages in personal fantasy and day dreams	.05	.41*	Creative, imaginative
Interprets clear cut situations in particularizing way	.07		
Compare self to others	.07	.30	Competitive likes to win
Tends to be self defensive	.08		
Over reactive to minor frustration	.08	.56***	Gets upset easily
Extra punitive; transfers and projects blame	.09		
Anxiety and tension produce bodily symptoms	.10	.28	Worrying, fearful
Sensitive to demands	.10	.22	Sensible, wise
Projects own motives onto others	.10		
Thin skinned; sensitive to criticism	.11		
Subtly negativistic	.11		
Appears straightforward and candid	.11		
Unpredictable and changeable	.11	.23	Impulsive
Withdraws from adversity	.13*		
Is ethically consistent	.13*		

Note. Funder's coefficients were based on two samples (n=41; n=64). Current sample, n=36.
*p<.05, **p<.01, ***.p<.001.

Table 4.2

Comparisons between descriptors from Funder's study and our sample.

Most agreement Descriptors (CAQ)	Self/other agreement		Descriptors (AJQ)
	(CAQ)	(AJQ)	
Concerned with philosophical problems	.51***	.29	Considerate, thoughtful
Talkative individual	.45***	.50**	Talkative
Values intellectual and cognitive matters	.44***	.19	Reasonable, logical
Regards self as physically attractive	.44***		
Self dramatizing	.44***	.56***	Gets upset easily
Initiates humour	.44***		
Skilled at pretending, humour	.43***		
Has social poise	.41***	.37*	Cheerful
Rebellious, nonconforming	.41***	.38*	Rebellious
Physically attractive	.37***		
Favours conservative values	.37***	-.19	Stubborn
Sex typed	.37***	.65***	Feminine
Enjoys aesthetic impressions	.36***		
Gregarious	.35***	.37*	Sociable
Emotionally bland	.34***	.20	Self controlled

Note. Funder's study, n =157. Current sample, n=36. *p<.05, **p<.01, ***p<.001.

Table 4.2a

Comparisons between descriptors from Funder's study and our sample.

Least agreement Descriptors (CAQ)	Self/other agreement		Descriptors (AJQ)
	(CAQ)	(AJQ)	
Denies unpleasant thoughts and conflicts	-.05		
Project feeling and motivation onto others	0		
Sensitive to demands	.01	.22	Sensible, wise
Insight onto own motives and behaviour	.05		
Transfer or project blame	.05		
Has brittle ego-defensive system	.07		
Aware of impression made on other	.12	-.09	Approval seeking
Compares self to others	.12	.30	Competitive likes to win
Generally fearful	.12	.28	Worrying, fearful
Has persistent preoccupying thoughts	.15*	.28	Worrying, fearful
Is subtly negativistic	.15*		
Perceptive to interpersonal cues	.16*	0	Sympathetic
Uncomfortable with uncertainty	.16*	.20	Orderly, neat
Creates and exploit dependency in people	.19**	.48**	Affectionate, loving
Self defensive	.27***		

Note. Funder's study n = 157. Current sample, n = 36. *p<.05, **p<.01, ***p<.001.

4.4.2. Implicit person theories, traits, self-concepts and general well-being

Table 4.3 showed zero order correlations between relevant variables. Higher scores on implicit person theories imply an endorsement for an incremental theory. H1 found partial support, with a positive correlation between implicit person theories and Extroversion and Openness to Experience, but not with Conscientiousness. Neuroticism was positively correlated with the support for an entity theory; in other words emotional stability was strongly related with an incremental point of view, although this specific outcome was not explicit in H1. Implicit person theories seemed independent from Self-esteem and Life satisfaction, here accounted as a measure of general well-being (H2). However, no significant correlation was found between Self-discrepancy and Self-esteem, although this association is well established in the field (Higgins, 1987) (H3).

Table 4.3

Implicit person theories and zero order correlations with variables of interest

	1	2	3	4	5	6	7	8
Implicit person theories	-							
Self-discrepancy	.14	-						
Life satisfaction	-.02	-.05	-					
Self-esteem	.03	-.08	.65**	-				
Extraversion	.27*	.09	.27*	.35*	-			
Agreeableness	.02	-.12	.36**	.29*	.14	-		
Conscientiousness	-.10	.19	.21	.14	.21	.10	-	
Neuroticism	-.27*	.21	-.39**	-.46**	-.20*	-.34*	.03	-
Openness to Experience	.30*	.35*	.06	.03	.07	-.07	-.07	.12

Note. n=52. *p<.05, **p<.01

Based on the results shown in Table 4.3, a multiple regression was conducted for explorative purposes. Extroversion, Openness to Experience and Neuroticism were initially regressed on support for an incremental point view. However, only Neuroticism and Openness to Experience appeared to be significant predictors (see Figure 4.1, a and b.), with $F(2, 49) = 5.60$, $p < .01$, with a total $R^2 = .19$ (adjusted $R^2 = .15$), and standardized $\beta = -.31$ and $.34$ respectively, ($p < .05$), $t(49) = -2.38$, $p < .05$, for Neuroticism

and $t(49)=2.62$, $p<.05$ for Openness. In particular, the stepwise procedure highlighted that both traits are equally relevant for the prediction of the dependent variable, with an additional $R^2=.09$ for each predictor and a F change $(1, 49)=5.65$, $p<.05$, when Openness was added as a second predictor.

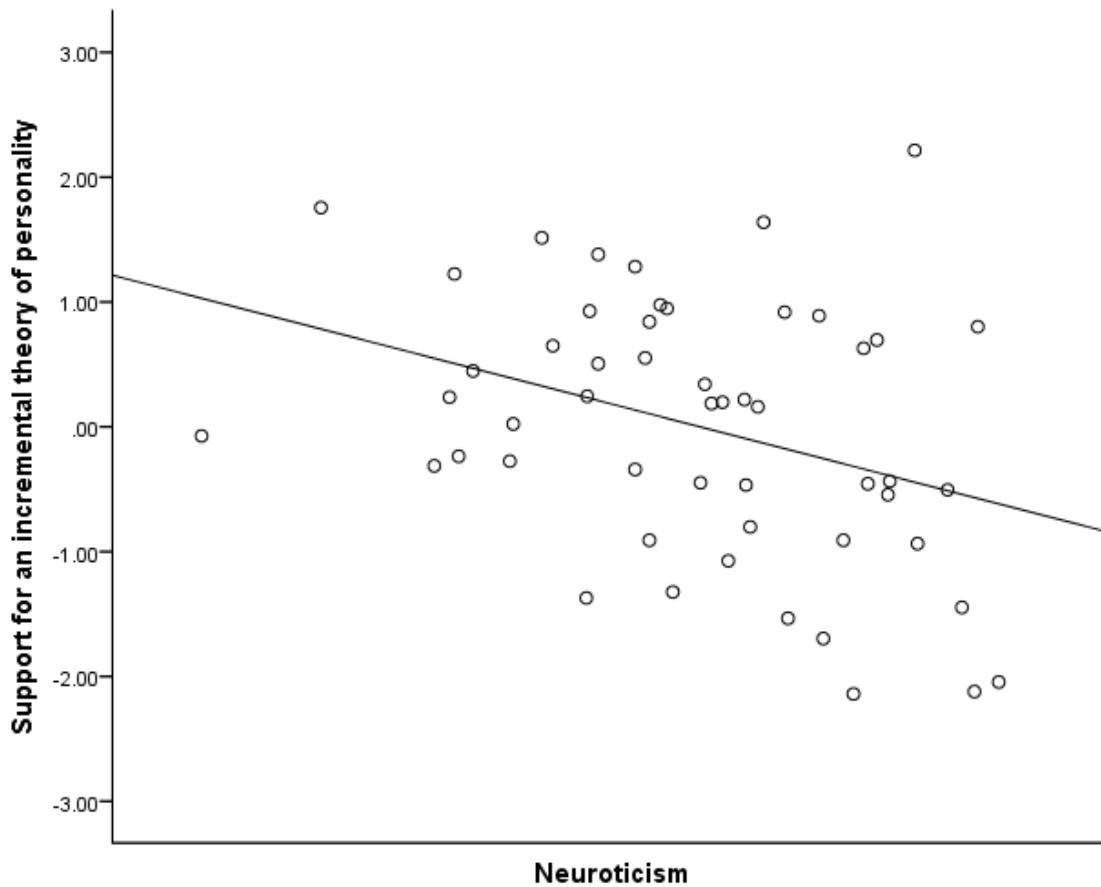


Figure 4.1a. Neuroticism is regressed on implicit person theories. Higher values on Y axis represented stronger support for an incremental view of personality

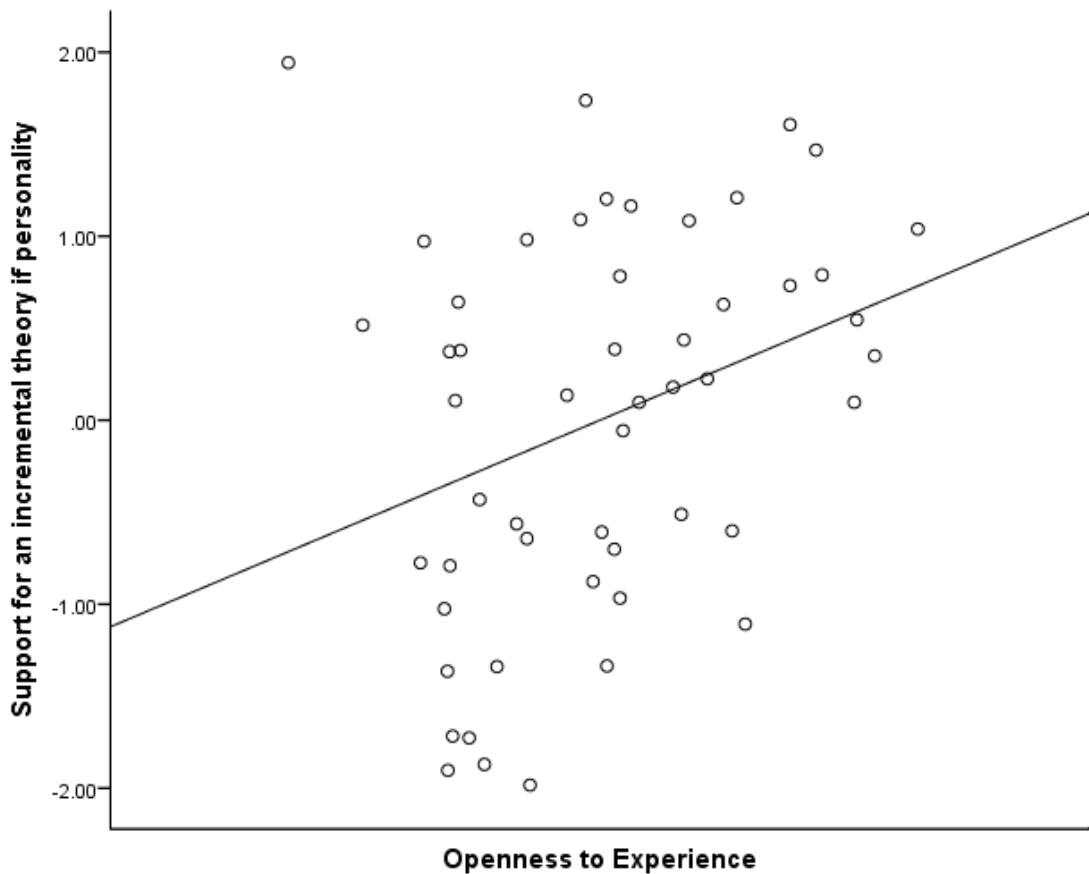


Figure 4.1b. Openness to Experience is regressed on implicit person theories. Higher values on Y axis represented stronger support for an incremental view of personality

4.5 Discussion

The Q-sortware was successfully shown to be a reliable tool for web based research as it offers the chance to administer self-report and Q-sort in the same procedure. The software reproduces all the features of the paper version of the Q-sort and it resembles results coming from studies in which description from another was considered (Funder & Colvin, 1988). Given the high number of tests introduced in a single procedure (six), it can be concluded that the software is particularly effective in saving time over data collection and administration; each participant completed the whole procedure in less than an hour. Some data, such as the description obtained from a peer or a friend, showed the advantage of using a web tool that can reach people located far away.

As far as implicit theories are concerned, support for incremental theories appeared to be associated with higher scores on Extroversion and Openness to Experience, thus providing support for the view that implicit person theories and personality are not independent constructs (H1). However, contrary to our hypothesis, Conscientiousness seemed unrelated to implicit theories, whereas Emotional Stability appeared to be associated with endorsement for incremental theory. In the light of these results, it can be argued that incremental theories are particularly related to those traits included in plasticity, that is, one of the 'Big Two' (Blackburn et al., 2004; DeYoung, 2006; DeYoung, Peterson, & Higgins, 2002). The concept of plasticity reflects the idea of a malleable attitude towards plans and events, which is a critical aspect for an incremental theorist.

As far as H2 is concerned, implicit person theories appeared to be unrelated to Life satisfaction here taken as a measure of general well-being. However, it should be noted that Neuroticism, which is often linked to a number of undesirable life outcomes (Costa & McCrae, 1980; Ormel, Riese, & Rosmalen, 2012; Saulsman & Page, 2004), was also related to an entity point of view, thus further research is necessary to clarify the relationship between implicit person theories and well-being. It should also be noted that Extroversion was no longer a predictor when inserted in a regression analysis, whereas Neuroticism and Openness were found to be linear predictors of support for incremental theories of personality. Finally, no association was found between implicit person theories and Self-esteem, contrary to our expectations, thus confirming the initial findings of Dweck, that is to say, that implicit theories are largely unrelated with Self-esteem and Self-discrepancy similarly showed no significance.

Nonetheless, it should be noted that several limitations prevented us from considering these results as definitive. First, the sample involved was too small to be representative of the generality of the population. This might be the reason why some of findings that are well established in the literature, such as the negative association

between Self-discrepancy and Self-esteem (Moretti & Higgins, 1990), were not found in this sample. With regard to the Q-sortware, the comparison between our study and that of Colvin and Funder (1988) was somewhat difficult to follow, given the diversity from the two versions of Q-sort used. Indeed, the differences between the two versions of Q-set used suggest that these results are far from being definitive, since the same version of Q-set should be used to compare the two media (paper and pencil and web) properly. It can, however, be said that the Q-sortware was successfully found to be a reliable tool for web and computer based research, in particular when longitudinal designs are involved, as was shown by the results of the test- retest section.

Chapter 5: Personality and implicit person theories

5.1 Introduction

Implicit theories are naïve assumptions about a target attribute (such as traits) held by an individual in everyday life (Dweck & Leggett, 1988). This construct has been shown to play a key role in the field of motivation, academic achievement, intimate relationships and work place relationships (Dweck, 2000). The success of the theory is also due to its role in setting up attitudes as well as driving plans and actions. Implicit theories distinguish between an entity and an incremental point of view, which represent two opposing world perspectives, sometimes referred as Growth and Fixed mindsets (Dweck, 2006). According to the specific domain taken into account (for example, morality, intelligence or personality), a Fixed (entity) mindset refers to the belief that the amount of a target attribute (such as intelligence) cannot be changed over time, whereas a Growth mindset implies that the same attribute is changeable. For an overview of the key concepts and definitions, Chapter 2 (see sections 2.1 and 2.2) provides a review of key findings from previous studies. Here, it is worth remembering that the two implicit theories are not thought of as singular across domains (that is, that an individual might hold an incremental perspective for, say, intelligence, but an entity perspective for personality). So, even if this individual perceives his intelligence as a stable entity, his ability to enjoy parties and take part to social events (that is to say, Extroversion) might change through time, as he holds an incremental perspective on this specific trait of his personality (Dweck et al., 1995). In general, the main contribution of implicit theories lies in the attempt to show that change is partially in the eye of the perceiver. However, not all the perceivers are the same since the perception of malleability evoked by implicit theories (little for entity theorists and bigger for

incremental theorists) is often referred to personal attributes; in this sense, it is essential to investigate whether implicit person theories and personality are related or not. It is reasonable to believe that some traits foster support for a specific mindset; for instance, Openness to Experience expresses an attention towards alternative ways to frame reality, a concept which is rather similar to an interest in the acquisition of new skills shown by incremental theorists (Spinath et al., 2003). Only a few studies have directly evaluated the association between implicit person theories and traits. In a sample of middle-aged adults, Spinath and colleagues (Spinath et al., 2003) found a significant but modest association between support for an incremental theory and Extroversion, Openness to Experience and Conscientiousness ($r=.11$, $r=.13$ and $r=.13$ respectively, $p<.0.01$), but the authors concluded that traits and implicit beliefs are independent. In addition, (Robins et al., 2005) evaluated personality change in a sample of emerging adults and found that support for an incremental theory was associated with increases in Extroversion and Openness to Experience. These two studies do somewhat contradict one another; the first from Spinath and colleagues concluded that personality traits and implicit theories are independent; the second from Robins *et al.* was not focused on the association between the two but rather on the impact that the endorsement of an incremental theory had on actual personality change. Nonetheless, the latter study concluded that personality change was affected by support for an incremental theory, thereby underpinning the idea that traits and implicit mindsets are related. Two important limitations shared by these two studies invite additional research; first, different tools were employed for the assessment of implicit person theories, hence it is harder to draw a general conclusion. Second, both studies measured personality using a variable centred approach (traits as assessed by the Big Five), even though this is largely unsatisfactory when a comprehensive description of individuals is needed (see Chapter 1, section 1.4.1.4). In fact, previous research in the field of individual differences has stressed how to summarise relevant aspects of a person, for instance through the Five

Factor Model (Digman, 1990; Goldberg, 1993; Goldberg & Shmelov, 1993; McCrae & Costa, 1997). However, the FFM and traits tests do offer an abstract and de-contextualised image of someone's personality. In order to recover the centrality of the individual and therefore investigate the relationship between implicit person theories and personality, person centred and variable centred approaches should be used together in order to obtain a comprehensive and rounded description of personality and of individual differences.

Based on the findings reported in Chapter 4 (see discussion, section 4.4), support for an incremental theory is expected to be associated with Extroversion and Openness to Experience. These two traits, in fact, appear to be linked with highly motivated individuals (Blackwell et al., 2007; Cury et al., 2006; Dweck, 2006) and mastery-oriented⁸ behaviour, which previous studies have often associated with support for an incremental theory (Blackwell et al., 2007; Zweig & Webster, 2004). Thus it is hypothesised that:

H1: Extroversion and Openness to Experiences are associated with strong support for an incremental implicit theory.

Additional analysis was carried out to investigate this hypothesis from a person-centred perspective in order to highlight whether specific groups of individuals help to characterise what an incremental/entity theorist actually is. However, the paucity of prior studies did not allow a specific hypothesis for this. Accordingly, this aspect of the study is largely exploratory. At a conjectural level, however, given that the studies discussed above highlighted a connection between a growth mindset and academic achievement and motivation, and motivation with high levels of Extroversion and Openness (Busato,

⁸ See section 2.4 for a clear description of mastery oriented behaviours

Prins, Elshout, & Hamaker, 2000; DeRaad & Schouwenburg, 1996; Zweig & Webster, 2004); it is expected that these findings are mirrored at an individual level.

A second area of concern stems from the relationships between self-concepts (that is, Self-esteem, Self-discrepancy and personal Life satisfaction) and implicit person theories. In fact, as shown extensively in Chapter 2, the results from over twenty years of research have promoted the notion that holding an incremental point of view leads to higher academic achievement (Blackwell et al., 2007; Dupeyrat & Marine, 2005), resistance to stereotype formation and endorsement (Levy et al., 1998), and durable intimate relationships (Kammrath & Dweck, 2006). Overall, then, it seems that holding an incremental point of view is generally advisable and useful for personal life satisfaction and Self-esteem. Indeed, one study found that support for an incremental point of view moderated the relationship between Self-esteem and Self-discrepancy (Renaud & McConnell, 2007). These conclusions suggest that being an incremental theorist is a good practice, whereas supporting an entity perspective leads to maladjustment and unhappiness, regardless of the attribute considered. In contrast with this view, Dweck proposed that there could be situations in which being an entity theorist is actually preferable whilst other contexts would benefit from support for an incremental theory (Dweck et al., 1995, 1995; Elliott & Dweck, 1988). In particular, a good performance (such as a good score in a mathematics test) is the ultimate source of Self-esteem for an entity theorist, as it reinforces the idea that a target attribute (such as intelligence) is a fixed gift. An incremental theorist, in contrast, is not focused on performance; regardless of the results obtained, the amount of intelligence possessed is perceived as malleable and it might be changed with time and effort. Rather, the acquisition of new skills and learning experiences leads to a sense of personal growth which ultimately fosters Self-esteem (Dweck et al., 1995; Nussbaum & Dweck, 2008). It should be noted that these intuitions remain at a conjectural level and that the experimental evidence available is not sufficient to establish the nature of the interaction

between Self-esteem and implicit theories. If what is speculated by Dweck is true, implicit theories should be associated neither with Self-esteem nor with Life satisfaction, as each mindset should trigger specific strategies to develop and maintain all these indicators at an acceptable level. However, it is reasonable to believe, in line with Renaud's (2007) conclusion, that an incremental mindset is generally associated with higher levels of Self-esteem. In other words, it is expected that holding an incremental person theory would weaken the already existing negative association between Self-discrepancy and Self-esteem (Higgins, 1987); in fact, believing that personal attributes can change should reduce the magnitude of the inverse association between Self-discrepancy and Self-esteem. Conversely, when a person believes that his or her personal attributes are fixed, Self-discrepancy would strongly affect Self-esteem since he or she would like to change the person he or she is, but this is not actually possible (entity theory). In conclusion, therefore, it is hypothesised that:

H2: Support for an incremental point of view is positively associated with Self-esteem and Life satisfaction.

H2b: Implicit person theories moderate the relationship between Self-discrepancy and Self-esteem.

5.2 Method

5.2.1. Participants

A total of 163 participants were recruited from students enrolled in their first year of any undergraduate course at the University of York. Only people with no previous university experience were selected. The immediate consequence was that age was not normally distributed, with an age range of 17-26, and $M = 19.08$. Only one subject was removed from the analysis because he declared himself to be over fifty. In addition, only

one subject was 26, thus this sample can be still considered based on emerging adults (Age range 18 – 25). Gender was not balanced, with 127 females and only 35 males. Although British universities require a standard knowledge of the English language, and being a native speaker was not set as a priority for this study, I asked the participants to specify whether they were native English speakers or not. This was because the majority of the personality tests and other material used in the current project had been validated within British samples and therefore tested in a western, individualistic culture. Information on how many years the participants had spent in the UK and their country of birth was also collected, given the high number of international and European students attending a university course at the University of York. Of the 162 participants, 52.5% were born in the UK and 56.8% claimed to be native English speakers; 20.9% of the participants came from Asian countries and the remaining 26.6% mostly came from European countries. On average, the participants had spent more than a decade in the UK ($M=11.05$, $SD=8.5$, $Mdn=18$), with 53.1% living in this country for at least fifteen years. In contrast, 37.7% of the sample had been in the UK for fewer than three years. Although none of these variables affected any of the analyses presented in the results section, this is a better attempt to describe the diversity and the specific features of the current sample rather than a vague reference to the ethnicity/race of participants (Taras, Roney, & Steel, 2009).

5.2.2. Measures

Personality; Adjective Q sort (AJQ). A Q-sort version for non-professional sorters was used to assess personality (Aguilar et al., 1998; Block, 2008). To complete the test, 42 adjectives had to be sorted into seven piles, ranging from 7 'Most Characteristic' to 1 'Least Characteristic'. Each box had a fixed number of adjectives (3,5,8,10,8,5,3, respectively). The scores were used for prototype extraction, as described below.

Big Five Personality Inventory (BFI). A measure of personality based on the FFM (John & Srivastava, 1999) was also administered. The test consists of 44 sentences which were rated by the participants with a 5 point Likert scale, ranging from 1 'Disagree strongly' to 5 'Agree strongly'. Internal consistency proved to be good to excellent for all five traits, with a Cronbach's alpha of .87 for Extroversion, .80 for Agreeableness, .82 for Conscientiousness, .81 for Neuroticism and .77 for Openness to Experience. Scores for each trait were averaged.

Self-esteem:. The *Rosenberg Self-esteem scale* (Rosenberg, 1965) is a common measure for Self-esteem, with ten items assessing individual personal evaluation, ranging from 1 'Strongly agree' to 4 'Strongly disagree'. The scores on items 2, 5, 6, 8 and 9 were reversed and then averaged to produce a score on self-esteem. The Cronbach's alpha was .89.

Life satisfaction; Brief Multidimensional Students' Life Satisfaction Scale (BMSLSS) (Seligson et al., 2003). This measure consists of six items based on an 8 point Likert scale, ranging from 1 'Terrible' to 8 'Delighted'. The content of the items refers to satisfaction at university and in the family, as well as social life. Scores were averaged and the Cronbach's alpha was .78.

Implicit theories: Two instruments were used to capture implicit mindsets: the first was the eight item instrument commonly used to evaluate implicit mindset as applied to the domain of personality and it is called IPT (Implicit theory theories) here for simplicity. (Dweck & Leggett, 1988). This instrument is based on a 6 point Likert scale, ranging from 1 'Strongly disagree' to 6 'Strongly agree'. Four items evaluating entity theory were reversed and averaged with those directly assessing the incremental theory. Consequently, higher scores represented stronger support for the incremental theory. Nonetheless, as pointed out previously (Chapter 2, section 2.8), Spinath and colleagues (2003) adopted another test based on 20 items with adjectives taken from the FFM, four for each trait. Again, for simplicity this test is named BIPT (Big Implicit Personality

theories). In order to easily compare the findings from this work with previous studies, I prefer to use both these tools for the assessment of implicit person theories. A 6 point Likert scale was used and items assessing entity theory were reversed and averaged with the rest of the items. Table 5.1 shows the four items used for each trait. See also Appendices B and C for a complete list of the items in the two tests.

Previous studies have shown that incremental items are particularly attractive (Blackwell et al., 2007; Levy et al., 1998), especially when used in longitudinal studies. Thus, for this second measure of IPT, more items directly assessing entity theory were introduced. Alpha reliability was good to excellent for the IPT (.91), which was based on eight items, and for the BIPT (.75) which was based on 20 items. Table 5.2 shows the item content for this latter test. Some previous works (Cury et al., 2006; Dupeyrat & Marine, 2005) have argued that implicit theories do not have a unidimensional structure. The current sample size was not ideal for a confirmatory factor analysis: nonetheless, a principal component analysis based on a correlation matrix and with a principal component method was conducted for both the IPT and the BIPT items. One factor was extracted for IPT, based on a clear screen plot with only one factor above one ($E = 5.61$) and this explained 70.13% of the variance. Following the same method, one factor was also retained for the BIPT, although it explained only 26.88% of the variance. As shown in Table 5.1, more variance would be explained if five factors had been retained; nonetheless, the one-factor solution was still the most appropriate, since the other factors comprised few items and were hardly interpretable. The results also suggested that the content of the BIPT items needs improvement. However, these preliminary analyses converged with the findings of the majority of previous studies (Chiu et al., 1997; Church, Katigbak, Del Prado, Vargas-Flores, Reyes, Pe-Pua, & Cabrera, 2005; Cury, Da Fonseca, Zahn, & Elliot, 2008; Taberero & Wood, 1999; Yeager, Trzesniewski, Tirri, Nokelainen, & Dweck, 2011) which provided evidence of the unidimensionality of the construct.

Self-discrepancy: A person centred measure for Self-discrepancy (Rogers & Dymond, 1954) was obtained from the AJQ, as described in Chapter 4. The participants sorted the same AJQ deck, this time keeping in mind the *person they would like to be*. Consequently, participants completed the sort by dragging and dropping adjectives into boxes, ranging from 1 'Least desirable' to 7 'Most desirable'. By computing a simple correlation based on a transposed matrix between this (ideal) AJQ sort and the (actual) AJQ sort, it was obtained a coefficient measuring self-discrepancy, with higher values indicating low discrepancy (high Self-agreement), and lower values suggesting high discrepancy (lower Self-agreement).

Table 5.1

Summary of exploratory factor analysis results for BIPT. Alpha reliability was .75.

Items ^a	Components					Com.
	1	2	3	4	5	
(Shy)	.67	-.03	.18	-.10	-.42	.67
(Blue)	.64	.12	.11	-.30	-.03	.52
(Open to new experiences)	.63	.00	.12	-.30	.09	.51
(Active imagination)	.63	.41	-.11	-.29	.20	.69
(Worrying)	.61	.17	.18	-.25	.10	.51
(Self-disciplined)	.58	-.35	-.28	.07	.21	.59
(Reserved)	.58	-.33	-.07	-.19	-.26	.55
(Distracted)	.58	.29	.10	-.18	.06	.46
(Mood swing)	.57	-.25	-.48	.22	.17	.70
(Bossy)	.57	-.51	-.16	.22	-.12	.67
(Trusting)	.55	-.26	.19	.01	-.16	.43
(Talkative)	.53	-.46	-.11	.21	-.33	.66
(Curious)	.43	-.06	-.42	.35	.43	.67
(Inventive)	.40	.61	-.23	-.03	.10	.60
(Relaxed)	.50	.57	-.22	.01	-.04	.63
(Rude)	.13	-.40	.55	.06	.39	.64
(Lazy)	.45	-.26	.51	-.01	.21	.57
(Sociable)	.18	.45	.23	.61	-.08	.67
(Tidy)	.38	.20	.44	.48	.23	.66
(Forgiving)	.36	.39	.11	.41	-.40	.62
Variance (%)	26.88	12.26	7.95	7.25	5.69	

Note. n=105. ^a items are worded following Table 5.2

Table 5.2

Samples of items for the implicit person theories based on the FFM (BIPT).

How (adjective) you are as a 'person' is hardly changeable by yourself

How (adjective) you are as a 'person' depends mainly on your effort

How (adjective) you are as a 'person' cannot be influenced by yourself

If someone is not very (adjective) as a child he or she cannot be very (adjective) as an adult either, even if he or she tries to

Note. Sentences were repeated five times, once for each trait, see Appendix C for the full list.

5.2.3. Procedure

The participants were recruited by means of on line advertisements and flyers were also distributed across the university campus. Participants were invited to book an appointment using a web tool offered by the psychology department. Each subject was then welcomed in a computer laboratory in order to complete the whole procedure using the Q-sortware (<http://www.qsortware.com>). They were informed that the experiment comprised two sections and they were also encouraged to take part in the whole study although they were free to withdraw at any time. The reward for taking part included participation in a lucky draw, in which ten £25 vouchers were given to the participants who completed the first wave. Data were saved and uploaded to SPSS v21 for subsequent analysis.

5.2.4. Data analysis plan

5.2.4.1. Derivation of prototypes

Prior to the actual hypotheses testing, a preliminary analysis was performed for the extraction and interpretation of prototypes from the Q-sort.

As shown by York and John (1992), an inverted factor analysis was used for the derivation of prototypes. The whole process can be summarised in three steps; i) the calculation of a convergence coefficient which is used to evaluate how many factors can be retained, ii) the actual inverted factor analysis, and iii) a follow-up analysis performed

using a discriminant function for the validation of the initial solution and the inclusion of ungrouped cases.

Convergence. Following Everett (1983), a convergence coefficient was calculated in order to find the optimal number of factors to retain. This index offers a measure of the probability that the prototypes extracted would be replicated across various samples and hence it represents a measure of the reliability of the solution retained (McCrae, Zonderman, Costa, Bond, & Paunonen, 1996). To calculate this, the original sample was split in two non-overlapping halves and an inverted factor analysis was performed in each sub-sample. This means that each correlation matrix $N \times V$ (number of participants \times variables) was transposed into a $V \times N$ matrix (variables \times participants) and therefore factor analysis could be performed on individuals rather than variables. To evaluate a good range of credible solutions, two to five factors were extracted in each sub-sample (principle component analysis followed by a Varimax rotation). After every forced choice analysis, factor scores were retained and eventually correlated with the matching solution obtained from the other sub-sample. It was expected that matching factors would display higher correlations (for example, the first factor extracted from the first sub-sample should be highly correlated with the first factor extracted from the second sub-sample and so on), although this is not always the case, as was found by Hart (Hart et al., 1997). Correlations between matching factors were eventually averaged to obtain the actual replicability coefficients: thus, following our example, four coefficients were produced, one for each forced choice analysis (two, three, four and five). Coefficients above .90 were considered reliable for the retention of the solution (Asendorpf & van Aken, 1999; Everett, 1983).

Inverted factor analysis. Depending on the convergence coefficient, an inverted factor analysis from the variables \times people matrix and based on the whole dataset was performed. In order to assign participants to factors, three conditions needed to be satisfied, as suggested by York and colleagues (see also Asendorpf & Van Aken, 2003;

Hart et al., 2003; Hart et al., 1997); (1) each factor loading should be at least .40, (2) the same person is not highly correlated in more than two factors, and (3) the difference between the highest loading and the second highest loading should exceed .20.

Subjects who did not meet all these criteria were coded in an 'ungrouped' category.

Discriminant function analysis. Once prototypes were extracted and participants were assigned to factors, inevitably a number of individuals were left unclassified, not surprisingly. According to Asendorpf (1999) and Funder (2007), prototypes should not be interpreted as rigid categories, therefore not all the participants were assigned to a factor. Nonetheless, among these individuals, some can be associated to one of the factors extracted by the use of a discriminant function analysis. At the same time, a discriminant analysis on the initial prototype solution was performed as a follow-up analysis in order to confirm the results from the inverted factor analysis. The inputs were the prototypes extracted and the outputs were the functions which maximised the differences between prototypes. These functions could be then used to assess the probability that a target individual belongs to a prototype. To do this, the scores from the Q-sort had to be inserted as predictors of the function. The number of functions is equal to N-1 prototypes extracted:

$$(1) D = v_1X_1 + v_2X_2 + v_3X_3 = v_iX_i$$

where D is the discriminant score, v_i is the discriminant coefficient of a target predictor and is equivalent to the beta weight of a regression coefficient, and X_i is the score of a target individual on variable v_i . Once the D score of a person has been calculated, it is compared with the centroid(s) of the prototype(s) extracted using Mahalanobis distance and finally assigned to the closest centroids (that is, a prototype).

5.2.4.2. Hypotheses testing

The results section concludes with hypotheses testing; H1 and H2 will first be explored with zero order correlations; in order to further explore the data, a series of regressions were performed for H1 and H2, whilst to test H2b a hierarchical regression was performed, with Self-esteem as the outcome. In the first step, only Self-discrepancy was entered, implicit theories were entered in the second and third steps including the interaction term (that is, the Self-discrepancy X implicit theories) (Frazier, Tix, & Barron, 2004).

5.3. Results

5.3.1. Derivation of prototypes

The original sample of 162 participants was split in two randomised and non-overlapping halves. For each sub-sample an inverted factor analysis based on principal component analysis (PCA) was performed, followed by a Varimax rotation. The PCA method was chosen in order to obtain factors reproducing the most representative linear combination of the initial PxV matrix (Field, 2009; Kline, 1993). The choice of a Varimax rotation was determined by the necessity to maximise the differences between the factors extracted. The analysis was repeated four times, thus extracting two to five factors. Table 5.3 shows the convergent coefficients table, as in York and colleagues (1992).

Table 5.3

Replicability coefficients; factor scores from each sub-sample are correlated with respect to the number of factors extracted

Factors extracted	1	2	3	4	5	M
2	.95	.82				.90
3	.91	.91	.39			.81
4	.76	.71	.53	.39		.61
5	.83	.83	.78	.62	.58	.75

Note. Factor scores were computed across 42 AJQ adjectives of each Sub-sample (n=81). Means were calculated using r to z Fisher transformation

Correlation coefficients were corrected with r to z Fisher transformation (James, Demaree, & Mulaik, 1986) in order to facilitate comparisons between the four different solutions. The results showed that the two-factor solution was most likely to be replicated (Barbaranelli, 2003; Everett, 1983). As the number of factors extracted increased, replicability coefficients tended to decrease, with the exception of the five-factor solution which was, however, hardly interpretable, also because each prototype would be representative of very few subjects. As regards the three-factor solution, the replicability coefficient still remains high, as it was above .70; however, the third factor appeared to be hardly replicable as the zero order correlation between the two sub-samples was below .40. Therefore, the most valuable option was the two-factor solution in terms of both replicability and prototype interpretation. Additional comments on this can be found in the discussion section. An inverted factor analysis based on the whole sample was then performed, followed by a Varimax rotation and forcing the extraction of two factors. The first and the second factor together explained 33.38% of the variance, 22% and 10% for the first and second factors respectively. Initially, 106 (65%) participants were assigned to one of the two factors, and the remaining 56 were left ungrouped. Finally, a discriminant analysis was applied to the classified participants. Scores on the 42 AJQ sorts from the 106 classified participants were entered as predictors of a regression model in order to obtain a discriminant function. This equation was used mainly to assign the participants left ungrouped. The analysis yielded an

output with a probability of a correct classification (based on Mahalanobis distance) and only participants with a $p > .95$ on one of the two prototypes were assigned. This criterion allowed the addition of 56 more individuals, making a total of 152 (93.8%), 79 in the first and 73 in the second prototype. Table 5.4 shows the most and least descriptive adjectives representing the two groups, based on the Z scores.

The two prototypes varied in terms of sociability, talkativeness and mature behaviour, with factor 1 representing a shy/introverted group of individuals and factor 2 a more sociable and talkative group. For simplicity, the first factor was referred to as 'Affiliation oriented' and the second factor was called 'Achievement oriented'; more details about the interpretations of the two factors are given in the discussion section.

The two prototypes did not differ in terms of age or gender with for age $t(150) = .40$, $p < .70$, ($M = 19.09$, $SD = 1.31$) and $t(150) = 1.25$, $p < .25$ for Gender, equal variances not assumed. The two prototypes also differed in terms of independence and responsibility, with the Affiliation oriented individuals scoring particularly high on 'Responsible' and very low on 'Rebellious' (see Table 5.4). Although both prototypes scored high on 'Ambitious' and 'Considerate', Achievement oriented individuals were more 'Ambitious' ($M = 4.29$, $SE = .17$) than Affiliation oriented individuals ($M = 3.62$, $SE = .16$), with $t(150) = -2.84$, $p < .01$ but less 'Considerate' ($M = 4.78$, $SE = .17$; $M = 5.90$, $SE = .12$), for Achievement oriented and Affiliation oriented individuals respectively, with $t(150) = 4.52$, $p < .001$, equal variances not assumed.

Therefore, 'Affectionate' was the only trait/label shared by the two groups. Similarly, among the most uncharacteristic adjectives only 'Restless' was shared by both prototypes.

Table 5.4

AJQ Items most and least descriptive of the two personality types, based on z scores.

Affiliation oriented		Achievement oriented	
Characteristic			
2.08	Considerate	1.98	Ambitious
1.58	Affectionate	1.75	Affectionate
1.4	Ambitious	1.37	Independent
1.1	Responsible	1.28	Curious
1.08	Sensible	1.21	Sociable
1.06	Shy	1.03	Considerate
0.95	Generous	0.85	Adventurous
0.84	Cheerful	0.83	Talkative
Uncharacteristic			
-2.2	Rebellious	-2.37	Shy
-2.13	Attention ^a	-2.25	Reserved
-2.07	Self centered	-1.53	Orderly
-1.49	Self confident	-1.37	Self centered
-1.35	Impulsive	-1.23	Rebellious
-1.25	Restless	-1.15	Obedient
-1.2	Assertive	-1.08	Restless
-0.94	Talkative	-0.94	I Get upset easily

Note. n=152, n1=79, n2=73. ^a I like to be in the center of the attention

Both groups rejected the adjectives 'Self-centered' and 'Rebellious' but this was particularly true for Affiliation oriented individuals (M=2.19, SE=.15 and M=2.08, SE=.13 respectively for 'Rebellious' and M=3.00, SE=.19, M=3.11, SE=.19) with a $t(150)=-3.37$, $p=.001$ for 'Self-centered' and $t(150)=-4.44$, $p<.001$, for 'Rebellious', both with equal variances not assumed).

A MANOVA (5x2) was conducted across the Big Five traits in order to evaluate the extent to which the two prototypes were able to detect individual differences. The overall model was significant with $F(5,146)=33.77$, $p<.001$, $V=.54$ using a Pillai trace. In particular, Table 5.5 shows that the two prototypes differed in terms of all traits with the exception of Openness to Experience, although even in this case the difference between groups was fairly close to significance ($p<0.07$). As regards the effect size, Extroversion

and Agreeableness were the most relevant traits accounting for the differences between the two groups.

Table 5.5

Mean, SD, F ratio and eta square between prototypes and BFI traits

BFI traits	M (SD)		F	p	Part. eta
	Affiliation	Achievement			
Extroversion	2.70 (.63)	3.77 (.74)	92.31	.001	.38
Agreeableness	3.87 (.59)	3.39 (.71)	20.38	.001	.12
Conscientiousness	3.41 (.72)	3.14 (.77)	4.98	.027	.03
Neuroticism	3.35 (.76)	2.98 (.78)	8.57	.030	.06
Openness	3.44 (.62)	3.64 (.73)	3.21	.075	.02

Note. n=152, n1=79, n2=73, df=1

A series of independent t-tests tested the two prototypes in terms of self-discrepancy, implicit person theories (both IPT and BIPT), Self-esteem and Life satisfaction; however, only Self-esteem was particularly high for Achievement oriented individuals (M=30.66, SE=.63, against M=28.01, SE=.62) with $t(150)=-2.64$, $p<.01$).

5.3.2. Hypotheses testing

Implicit person theories and personality.

As a starting point, Table 5.6 shows zero order correlations to explore H1.

Preliminary data screening led to the detection of only two univariate outliers (z scores >3.0), which were removed from this analysis. As a guideline for the interpretation of the correlations, higher scores in both the IPT and the BIPT indicated stronger support for an incremental point of view. As far as the relationship between personality traits and implicit person theories is concerned, support for an incremental theory of personality was positively associated with Agreeableness and Emotional Stability (that is, reversed Neuroticism) with respect to the IPT; on the other hand, Extroversion, Emotional Stability and Openness to Experience were positively associated with the BIPT. As a consequence, implicit mindsets and personality traits were not independent

constructs, despite the fact that the IPT and the BIPT yielded different associations, with BIPT scores conceptually closer to the expectations formulated in Chapter 4 (H1, see Introduction, section 4.1).

Table 5.6

Zero order correlations between IPT, BIPT (implicit person theories), and the Big Five traits

	1	2	3	4	5	6	7
1 IPT ^a	-						
2 BIPT ^a	.45**	-					
3 Extroversion	.11	.21**	-				
4 Agreeableness	.18**	.14	-.04	-			
5 Conscientiousness	.09	.16	.09	.14	-		
6 Neuroticism	-.19*	-.21**	-.26**	-.11	-.09	-	
7 Openness	.03	.19*	.11	.03	-.16*	-.14	-

Note. n=157, p<.05, **p<.01, ***p<.001, ^aHigher scores indicated support for the incremental theory

A multiple regression based on the whole sample was then performed in order to see whether scores on traits anticipated support for an incremental point of view. Preliminary data screening for both univariate and multivariate outliers did not raise any concern except for one univariate outlier, z score > 3.0, (BIPT). Extroversion, Conscientiousness and Openness to Experience were entered as predictors with method: ENTER and the BIPT was the dependent variable. The results are shown in Table 5.7. The upper part of the table further confirms H1, since the three traits were relevant predictors of BIPT scores. The second part of the table shows that prototypes moderated the support for an incremental theory (Baron & Kenny, 1986; Frazier et al., 2004). When multiple regression analysis was conducted on the Affiliated oriented individuals, only Extroversion and Openness to Experience predicted support for an incremental point of view, whereas Agreeableness and Conscientiousness predicted support for an incremental person theory only in Achievement oriented individuals.

Table 5.7Multiple regression; BFI traits are regressed on BIPT^a (ENTER)

Model	Predictors	B	SE B	β	R ²
Total: n=161.					
	Extroversion	.09	.04	.17*	.04
	Conscientiousness	.11	.05	.18*	.02
	Openness	.14	.05	.21*	.04
Affiliation oriented: n=78.					
	Extroversion	.17	.08	.23*	.06*
	Conscientiousness	.01	.07	.01	0
	Openness	.20	.08	.26*	.07*
Achievement oriented: n=73.					
	Agreeableness	.18	.07	.26*	.08*
	Conscientiousness	.21	.07	.33**	.11**
	Openness	.13	.07	.21	.04

Total: R²=.22, F(3)=5.95, p<.01Affiliation oriented: R²=.13, F(2)=5.17, p<.01Achievement oriented: R²=.19, F(2)=8.04, p<.01Note. *p<.05, **p<.01.^aHigher scores indicate support for incremental theory*Implicit person theories and self-concepts*

In order to test H2 and explore H2b, zero order correlations (see Table 5.8) were used to examine associations between Life satisfaction, Self-agreement, Self-esteem and implicit theories. Both the IPT and the BIPT were observed to be significant and positively associated with Self-esteem and Life satisfaction, although the BIPT was poorly related with Life satisfaction, ($r=.15$, $p=.06$). Self-agreement (the inverse of Self-discrepancy), was transformed using the r to z Fisher transformation (James et al., 1986) prior to the actual analysis, and it was positively associated only with the BIPT. As already pointed out in section 5.3.1, the prototypes did not differ in terms of Life satisfaction.

In order to test whether support of an incremental theory moderated the relationship between Self-discrepancy and Self-esteem or not (H2b), two separate strands of hierarchical regressions were conducted, one for each measure of implicit person theory. Each strand comprised three steps; in the first, only Self-discrepancy was entered as a predictor. In the second and the third steps, implicit person theory and the

Table 5.8

Zero order correlations between self-concepts and implicit person theories

	1	2	3	4	5
1 IPT	-				
2 BIPT	.44***	-			
3 Life Satisfaction	.26**	15 [†]			
4 Self-esteem	.20*	.25**	.58***	-	
5 Self Agreement	0.07	.21**	.36***	0.44***	0

Note. n=158. † p<.10, *p<.05, ** p<.01, ***p<.001 a Inversed self-esteem.

interaction term (for example, IPTxSelf-discrepancy) were entered respectively (Baron & Kenny, 1986). In order to prevent multi-collinearity between the two predictors and the interaction term, Self-discrepancy IPT and BIPT scores were centred (Frazier et al., 2004). The upper part of Table 5.9 shows the third step of the hierarchical regression based on the whole sample and for the two strands, that is, BIPT (left) and IPT (right). Four univariate outliers with z score>3 were removed from the analysis in the first strand, three from the Self-agreement index and only one from the BIPT. Therefore, the second strand included one participant more (N=159 against N=158). The results in both cases suggested that support for an incremental theory in itself had an impact on Self-esteem, although it should be noted that Self-agreement (inverse Self-discrepancy) remained the best predictor for scores on self-esteem. Additionally, the lower part of Table 5.9 includes the same set of hierarchical regressions considering both Affiliation oriented and Achievement oriented individuals.

Table 5.9

Multiple regression; BIPT and Self-agreement are regressed on Self-esteem (ENTER)

BIPT					IPT				
Predictors	B	SE B	β	R ²	Predictors	B	SE B	β	R ²
Total: n=158, R ² =.22, F(3)=14.81, p<.001					Total: n=159, R ² =.23, F(3)=15.47, p<.001				
Self A	9.24	1.64	.41***	.20***	Self A	9.85	1.61	.43***	.20**
BIPT	2.04	.86	.17**	.03**	IPT	1.16	.44	.17**	.03*
BIPT*Self A ^a	.96	3.38	.02	0	IPT*Self A ^a	2.71	1.76	.13 [†]	.02 [†]
Affiliation oriented; n=77, R ² =.24, F(3)=7.76, p<.001					Affiliation oriented; n=78, R ² =.25, F(3)=8.21, p<.001				
Self A	9.43	2.21	.345	.23***	Self A	9.62	2.14	.46***	.21***
BIPT	1.34	1.24	.12	.01	IPT	1.03	.63	.17	.02
BIPT*Self A ^a	-.01	4.56	0	0	IPT*Self A ^a	3.64	2.45	.16	.01
Achievement oriented; n=72, R ² =.18, F(3)=4.87, p<.01					Achievement oriented; n=72, R ² =.17, F(2)=8.04, p<.01				
Self A	7.26	2.47	.33**	.13**	Self A ^a	7.94	2.58	.36**	.13*
BIPT	2.35	1.26	.21 [†]	.05*	IPT	.81	.70	.14	.03
BIPT*Self A ^a	3.16	5.1	.07	.01	IPT*Self A ^a	2.93	2.83	.12	.01

Note. *p<.05, **p<.01, ***p<.001, †<.10 ^aSelf-other agreement (inverse Self-discrepancy)

5.4. Discussion

The aim of this chapter was to investigate the construct of implicit person theories with attention to three main areas: personality, self-concepts and well-being.

From a general point of view, the interdependence between traits and implicit theories was corroborated by two distinct measures of implicit person theories (BIPT and IPT), although H1 was fully confirmed only when the BIPT scores were taken into account. As far as traits are concerned, implicit person theories (BIPT) appeared to be positively associated with Extroversion, Emotional Stability and Openness to Experience; however, multiple regression showed that Conscientiousness rather than Emotional Stability anticipated support for an incremental theory, again, together with Extroversion and Openness (H1). Not surprisingly, these traits reflected aspects invariably associated with incremental theorists (Dweck et al., 1995; Graham, 1995). To illustrate, the ability to frame situations in different ways expressed by Openness to Experiences (McCrae, 1987) is conceptually close to the belief that personal attributes are malleable. Similarly, empirical evidence has suggested that incremental theorists are associated with belief in effort (Dweck, 2006; Dweck et al., 1995), which connects them with highly conscientious people and active individuals (that is, with Extroversion). In summary, these traits described a set of behavioural characteristics that elicited a growth mindset, and, in other words, reflected the critical attributes of a committed person. In addition, the two prototypes moderated the relationship between personality traits and implicit person theories. In particular, Extroversion and Openness to Experience predicted support for an incremental theory only for Affiliation oriented individuals, whereas Agreeableness and Conscientiousness predicted endorsement of a growth mindset in Achievement oriented individuals.

With respect to Self-esteem and Life satisfaction (H2), implicit person theories showed a direct association with both the IPT and the BIPT, thus showing that support for an entity point of view anticipated lower Self-esteem. Previous findings (Renaud &

McConnell, 2007) were not confirmed because implicit theories did not moderate the relationships between Self-discrepancy and Self-esteem (H2b). Nonetheless, these findings are consistent with more recent evidence (King, 2012) in which support for an incremental point of view in the domain of intelligence was strongly associated with individual Self-esteem and a number of general well-being indicators (Life satisfaction, among others) in a sample of students from the Philippines. As anticipated in the Introduction, these results appear to be in contrast with some conjectures proposed by Dweck; in some of her works (Dweck et al., 1995; Dweck & Leggett, 1988; Molden & Dweck, 2006), she argued that entity theorists find in the outcome of a given performance the source of their Self-esteem, whereas incremental theorists enhance it by acquiring new skills. These conjectures are notable when it is argued that both Growth and Fixed mindsets are equally adaptive (Nussbaum & Dweck, 2008). However, our results supported the notion that having fixed personal attributes is detrimental in itself for Self-esteem. Arguably, the belief that our personal attributes are fixed can be frustrating if it is relevant for our future career or any type of project. In contrast, by holding an incremental theory, much room is left for a better future, whether change is due to external events or because we make an effort towards the desired change. In the same vein, implicit person theories appear to be directly associated with Life satisfaction (H2), thus supporting the idea that holding an incremental point of view is, after all, a better way to face everyday life, especially as far as emerging adulthood is concerned (King, 2012). These years, in fact, are characterised by strong instability and a constant tension towards a number of long-lasting life projects (such as career, intimate relationship or/and family formation). In principle, holding an incremental perspective is encouraging and it opens more options (Tabernero & Wood, 1999), especially in individualistic cultures where individual initiative is valued (Maurer, Wrenn, Pierce, Tross, & Collins, 2003).

5.4.1. Conclusive considerations (a); the assessment of implicit person theories

Some considerations are necessary as far as implicit person theories are concerned. As already noted, Table 5.6 showed that the two measures of implicit person theories are positively associated with one another, with a Pearson correlation coefficient of .46, $p < .001$ (two tailed). Given that the two tests measured the same construct, it could be noted that this association is not sufficiently strong. Perhaps this is because they reflected the fact that the two tests were measuring the same construct at two distinct levels, one quite abstract and broad (IPT), the other through a set of more concrete traits-labels (BIPT). In line with what suggested by Poon and Koehler (2006) they might trigger different answers because the items across the two tests varied in terms of accessibility. To illustrate, a person might believe that his/her overall personality is fixed even though some aspects, (such as emotional stability) are more malleable than others. It should also be noted that in both cases implicit person theories are a unidimensional construct in which the incremental and the entity theory are two opposite poles of the same construct. Thus, the evaluation of a mindset (that is, personality as a whole) is related to yet slightly different from the evaluation of the same theory when it is defined through a set of distinct aspects. In other words, the two tools inquired into two slightly alternative domains.

5.4.2. Conclusive considerations (b); prototypes

The two prototypes extracted (Affiliation oriented and Achievement oriented) represent an original contribution of the current project. In fact, despite the growing attention towards emerging adulthood, little information is available as far as the distinctive characteristics of this earliest stage of adulthood are concerned. At a descriptive level, the two prototypes extracted clearly reflected two crucial aspects (Arnett, 2000; Schwartz, Côté, & Arnett, 2005); on the one hand, Affiliation oriented individuals are concerned about others and they are defined by a robust sense of

belonging. They seem to represent those emerging adults strongly interested in exploring intimate relationships and willing to test companionship at a mature level. On the other hand, Achievement oriented individuals appear to be career-oriented and focused on obtaining a successful job after university. This second group was particularly active and flexible, assertive and open to exploring new experiences. Given that person centred approaches are not yet widely used in the research mainstream, an immediate connection with other theories or previous works is hardly reliable. However, since the two prototypes varied greatly in terms of personality traits, an immediate parallel might be established with the theory of sensation seekers proposed by Marvin Zuckerman (Zuckerman, Eysenck, & Eysenck, 1978; Zuckerman, Mangels, Neary, Brustman, & Bone, 1972). With scores particularly high on Extroversion and Openness to Experiences, Achievement oriented individuals resemble a prototypical sensation seeker (Aluja, Garcia, & Garcia, 2003). On the opposite side, Affiliation oriented individuals recall a more stable group of individuals, perhaps likely to be satisfied with a quiet, relaxed life-style.

In conclusion, it should be noted that the analysis proposed here stemmed from the use of inverted factor analysis, which is believed to be the ideal tool for the extraction of prototypes (Asendorpf, 2009), but it is not the only option. In fact, other applications of person centred approaches have employed latent profile analysis (e.g. see Tuominen-Soini, Salmela-Aro, & Niemivirta, 2008, 2011). Similarly, other authors have preferred to combine inverted factor analysis with the extraction of clusters (Asendorpf, 2003). Whilst keeping rich the debate on the most appropriate statistical technique for the extraction of prototypes, an agreement or, say, a common practice for their extraction would be a corner-stone for the diffusion of the person centred approach, which is an essential part for the study of personality.

5.4.3. Points for improvement and future directions

Several factors should be considered which render these results far from being definitive. Broadly, although the current project was designed for the study of emerging adults, other samples larger in size and coming from a non-academic context could reinforce the conclusions drawn here. In fact, even if emerging adults are significantly sampled over the university population, the risk of under-representing those individuals who choose not to pursue a university course to explore their future prospects is relevant. The current sample, indeed, represented a specific sub-group of the general population which has access to a higher education system and is arguably supported by a social economic status which encourages career success. It might be the case that under different life conditions, implicit theories about personal attributes might play another role which is not captured by a student population, or perhaps implicit mindsets might simply have a different salience with respect to personal attributes. As regards the tools used for the assessment of implicit person theories, this study has highlighted that the internal structure of the BIPT test could be greatly improved in terms of item content and hence suggesting, in general, that more attention should be paid when choosing how to assess implicit mindsets.

A final consideration concerns the version of Q-sort used. Despite the fact that it is to our knowledge the only version of Q-sort available for non-professional sorters, the AJQ deck is comprised of single words, quite abstract and fairly distant from the concept of descriptors, in which relevant scenarios, rather than a single trait/label, are brought to the attention of the participants (for example see Block, 2008). For more fruitful applications of Q-sort in research, it is to be hoped that richer versions of Q-sorts for non-professional sorters would be validated in the future.

5.4.4. General conclusion

The current study has clarified the role of implicit person theories in a sample of emerging adults and it has highlighted new prospects in the field of personality assessment. For the first time, there has been a clear attempt to describe what predicts support for an incremental/entity point of view, both from a variable and a person centred approach. Support for an incremental point of view is probably a *preferable* mindset, at least for strongly ambitious and highly career-oriented individuals such as those represented in this study by students (that is, Achievement oriented individuals) at the beginning of a university course (Da Fonseca, Cury, Santos, Sarrazin, Poinso, & Deruelle, 2010; Kappes, Stephens, & Oettingen, 2011). Although the analysis conducted in this project has underpinned the idea that personality traits *generated* the mindset of individuals, it is still to be established what the nature of the relationship between the two is; in other words, it is possible that implicit person theories are at the top of a chain of psychological events which ultimately predicts scores on personality traits. Against this background, the next chapter considers personality change in emerging adulthood and the subsequent role of implicit person theories.

Chapter 6: Personality change

6.1. Introduction

Chapter 5 examined the first wave of this longitudinal project with a focus on cross-sectional data. This chapter deals with the second wave of data and the attention shifts towards longitudinal analyses and personality change.

For the very first time, this chapter seeks to investigate personality change in a sample of mostly emerging adults enrolled on a university degree course. As already discussed in Chapter 1 (see section 1.2.2.1), whereas 'young adulthood' is a general term referring to adults with an age ranging from 26 to 40, the term 'emerging adults' best describes the first decade of adulthood after the teenage years, that is, from age 18 to 25 (Arnett, 2000, 2007). Emerging adults are characterised by a constant instability because they are continually exploring a variety of new experiences while planning a future career and looking for durable companionship. Emerging adults are more responsible and experienced than teenagers, but not yet as mature as young adults, since they are still delving into the type of person they would like to be. For all these reasons, this decade represents a privileged context from which to observe personality changes, with particular attention towards the mechanisms triggering them. In order to do this, it is essential to choose an appropriate time window between assessments. In fact, Roberts and colleagues (Robins et al., 2001) reported that longitudinal studies are often rather durable, with data collected at two or more quite distant stages (e.g., see Human, Biesanz, Miller, Chen, Lachman, & Seeman, 2013), under the assumption that time in itself is a powerful source of change, since it accounts for personality change due to natural maturational processes (Roberts & DelVecchio, 2000). However, these studies often miss what happens between one assessment and the next and it is consequently hard to grasp precisely what causes change. The risk is that longitudinal

research becomes a series of static snapshots, thus failing to capture the dynamic nature of personality (Dweck, 1996). This current project therefore considered a time window of thirteen months, which is thought to be a reasonable time. In fact, this period represents a turning point, since emerging adults face a series of new experiences and important life-time decisions, as discussed in Chapter 1 (see section 1.2.2). Students recently enrolled at university are full of hopes, plans and strong expectations and for the very first time they attempt to realise what was only dreamed of during their teenage years (Luyckx, Soenens, & Goossens, 2006). Moreover, going to university often implies change in residence and/or city, several novelties within social activities, new friendships and many other responsibilities that might be both exciting and frustrating at the same time (Blatterer, 2010). These events are a potential source of change; they might affect personal satisfaction and eventually impact on the adaptation required for the new stage of life just started.

Additionally, in Chapter 1 several indicators of change were reviewed (mean level, rank order and ipsative). For assessing personality change using these indices, the variable centred and the person centred approaches are used together in order to look at personality beyond the over-simplified idea that personality is fully described by a set few traits (see Chapter 1, section 1.4.1).

By measuring personality using multiple perspectives, the current project seeks to identify those mechanisms that ultimately drive change. In particular, in line with what is suggested by Dweck (Dweck, 2008; Dweck & Leggett, 1988; Olson & Dweck, 2008) individuals make decisions and take actions under the influence of naïve and often not explicit theories about various life domains, including personal attributes. These implicit beliefs endorsed by individuals in everyday life can play a key role in personality change (Kappes et al., 2011). In particular, the belief that personality attributes are malleable implies that change is thought to be always a possible outcome, whether through time or effort or chance; indeed, one previous study showed that support for an incremental

person theory predicted mean level change in Openness and variations in Extroversion in a sample of emerging adults (Robins et al., 2005). Thus, the hypothesis is formulated as follows:

H3: It is expected that endorsing an incremental theory about personality attributes will give rise to higher mean level trait change, and lower rank order and ipsative stability.

This study introduces several novelties, not only from a methodological point of view, but also in terms of theoretical perspectives. Consequently, this study is largely explorative because the fact that no previous research has been based upon person centred approaches encourages a more detailed hypothesis.

6.2. Method

6.2.1. Participants

The second wave comprised a sample of 118 participants who were returning to complete the final part of the longitudinal study thirteen months after the completion of the first wave (November 2009). As expected, the sample was biased toward females (81%). Age range was 18 – 26, (M=20.15, SD=3.00).

6.2.2. Measures

Personality: *Adjective Q-sort (AJQ)*. The same version of Q-sort used at T1 (see Chapter 5) was employed at T2 to assess personality from a person centred perspective (Aguilar et al., 1998; Block, 2008). There were 42 adjectives written on cards and the participants were asked to sort them into seven boxes, ranging from 1 'Least characteristic' to 7 'Most characteristic'. The seven boxes had a predetermined number

of adjectives to be filled with (i.e. 3,5,8,10,8,5,3, respectively). See Appendix A for the full list of adjectives.

Big Five Personality Inventory (BFI). Personality traits were assessed using a 44-item version of the FFM based on an English sample (John & Srivastava, 1999). Each statement was evaluated using a 5 point Likert scale, ranging from 1 'Disagree strongly' to 5 'Agree strongly'. Internal reliability (Cronbach's Alpha) was satisfactory, with Extroversion scoring .87, Agreeableness .76 and Conscientiousness, Neuroticism, and Openness to Experience each scoring .84.

Self-esteem: Rosenberg Self-esteem scale (Rosenberg, 1965). Self-esteem was measured by a ten item test based on a 4 point Likert scale, ranging from 1 'Strongly agree' to 4 'Strongly disagree'. Items 3, 5, 8, 9 and 10 were reversed and averaged with the remaining ones. Alpha at T2 was .90.

Implicit theories: (IPT, BIPT). Implicit person theories were assessed by two tests; the first (IPT) was based on eight statements which were evaluated by a 6 point Likert scale, ranging from 1 'Strongly disagree' to 6 'Strongly agree' (Dweck & Leggett, 1988). The four items assessing entity theory were reversed and then averaged with those assessing incremental theory. Higher scores represented stronger support for an incremental personality theory. The second test, (BIPT) was based on twenty adjectives which were arranged into five groups of four sentences each (Spinath et al., 2003). For more details about the internal structure of the test and its characteristics, see Chapter 5 (see specifically section 5.2.2 and Table 5.1). Each group of statements explored a trait and the twenty adjectives were taken from the FFM. Again, items assessing entity theory were reversed and finally averaged with those items referring to incremental theory. Similar to the IPT, BIPT statements were measured by a six-6 point Likert scale, ranging from 1 'Strongly disagree' to 6 'Strongly agree'. Cronbach's Alpha for internal reliability was satisfactory for both the IPT (.91) and the BIPT (.83), thus reinforcing the

notion that implicit person theories are based upon one single dimension in which incremental and entity theories are two opposing poles.

Self-discrepancy: A measure of Self-discrepancy was computed using a correlation coefficient between the AJQ sort and an ideal AJQ sort (Pavot et al., 1997; Rogers & Dymond, 1954). Following the procedure described in Chapter 5, at T2 the participants were asked to complete the same AJQ sort a second time, but now thinking about their ideal self, that is to say, the person they would like to be. For this reason, the seven boxes were labelled differently, from 1 'Least desirable' to 7 'Most desirable'. Similar to the actual AJQ, the ideal AJQ boxes had to be filled with a predetermined number of adjectives, thus forcing a quasi-normal distribution (that is 3,5,8,10,8,5,3). The correlation coefficient resulting from the comparison between the actual AJQ sort and the ideal AJQ was corrected using r to z Fisher transformation. Higher values represented little ideal-self-discrepancy (read high Self-agreement).

Stressful events: *Life stressful events* (LSE). A list 32 stressful events was taken from an adult checklist (Sarason, Johnson, & Siegel, 1978). The events included a number of episodes specifically related to university life (for example, withdrawal from a course and experiencing financial issues with the university) and a comprehensive list of accidents, such as the loss of a relative, the loss of a close friend, sudden financial change or abortion. Appendix D shows the full list of stressful events chosen for this study. Unlike the original test, the response format was dichotomous, and participants were asked to click on those events which had occurred to them. Their answers were summed in a single index representing the number of stressful events encountered by each individual.

6.2.3. Procedure

Thirteen months after the beginning of their university course, participants were contacted through the Q-sortware (<http://www.qsortware.com>) and invited to participate

in the second and final part of the experiment. Each participant who responded booked an appointment and went to a computer laboratory on the university campus to complete the whole procedure. The participants were then debriefed and thanked with £5 for their contribution.

6.2.4. Data analysis plan

The results were organised into three sections according to the three main themes discussed in this chapter. The first section concerned the evaluation of personality change. This involved the calculation of mean level change, rank order stability and ipsative change. Mean level trait variations were computed as the difference between the trait measures at T1 and T2. Cohen's D was used to assess the magnitude of these differences (that is, the effect size). Rank order stability was calculated using correlation coefficients between the measures of a given trait at T1 and T2; this means that values close to 0 indicated maximum change and values close to 1 indicated maximum stability. Q-correlations were used to evaluate ipsative stability or change (Klimstra, Hale, Raaijmakers, Branje, & Meeus, 2009; Ozer & Gjerde, 1989; Roberts, Caspi, & Moffitt, 2001). Q-correlations are conceptually very close to rank order coefficients, with the difference that people rather than variables are correlated. This means that the correlation coefficient was calculated using the 42 adjectives sorted by each individual at T1 and at T2. However, because the Q-sort was not organised around fixed attributes as in a more traditional variable centred approach, it is often advisable to run a test re-test section in order to distinguish the error term from the actual ipsative change.

The second section was devoted to the data gathered at T2 only. This involved the replication of the prototypes extracted at T1. The procedure to obtain prototypes is fully described in Chapter 5, (see section 5.2.4.1). To decide whether the two prototypes were replicated at T2 or not, once they were extracted from the sample of returning

participants, a simple correlation with the prototypes extracted at T1 was performed. Additionally, this section sought to investigate a number of cross-sectional hypotheses already tested at T1, namely H1, H2 and H2b (see Introduction in Chapter 5, section 5.1) in order to evaluate the extent to which the conclusions drawn at T1 were consistently supported at T2.

The third section addressed H1 as stated in this chapter. In order to do this, an ANOVA mixed design was used; implicit person theories were inserted as a between-subject measure in order to evaluate the extent to which they explain personality trait change (within subject measure). All the analyses were performed using SPSS v.21. Data were uploaded to the statistical package with an *.txt file downloaded from the Q-sortware. A random code was assigned to participants at T1 and at T2, so as to recall how many participants completed both waves of data and to protect their privacy.

6.3. Results

6.3.1. Stability and change

Table 6.1 shows mean level and rank order changes for the Big Five. A significant increase in Extroversion and a significant decrease in Conscientiousness was observed. Cohen's D coefficient was shown to be close to .30, which can be considered a medium effect size (Cohen, 1988, 1992). On the other hand, rank order stability appeared to be particularly high, with all traits scoring .75 (for Neuroticism) or more.

Table 6.1 also includes Self-esteem, Life satisfaction and implicit person theories. Among these, implicit person theories are of particular interest, not only because one single study assessed their stability or change over time (Robins & Pals, 2002), but also because it is essential to understand the stability/change of the construct for the purposes of the current study. The results outlined here suggested that both the IPT and the BIPT were stable, at least as far as mean level change is concerned. Rank

order coefficients, on the other hand, showed the lowest stability among all the variables observed.

Table 6.1

Mean level and rank order change in personality traits and variables of interest.

Dimension	T1	T2	t	p	Cohen's D	Rank order Change
	M (SD)	M (SD)				
Extroversion	3.02 (.90)	3.16 (.79)	-2.63	.01	.26*	.80
Agreeableness	3.60 (.67)	3.61 (.68)	-.10	-.92	ns.	.80
Conscientiousness	3.47 (.72)	3.33 (.73)	2.94	.004	.29*	.77
Neuroticism	3.17 (.82)	3.21 (.78)	-.60	.55	ns.	.75
Openness	3.46 (.74)	3.51 (.69)	-1.27	.29	ns.	.83
Self-esteem	2.96 (.57)	2.93 (.56)	-.59	.55	ns.	.67
Life Satisfaction	5.27 (.82)	5.26 (.90)	.26	.79	ns.	.64
BIPT	4.14 (.57)	4.19 (.48)	-1.05	.20	ns.	.58
IPT	3.69 (.89)	3.67 (.92)	.18	.86	ns.	.54

Note. n=105, *p<.05.

Nonetheless, these results are somewhat consistent with the findings of Robins and Pals (2002), who reported a coefficient of .63 for IPT rank order stability in a sample of college students who were followed for four years. In the present case, however, the construct was applied to the domain of personality rather than intelligence.

Figure 6.1 shows the Ipsative change index (ICI) as obtained by Q-correlations (Pavot et al., 1997) with M=.79 and SD=.24. Considering that the test-retest value taken on the earlier study was M=.79 and SD=.08, it can be concluded that the sample did not show any significant ipsative change.

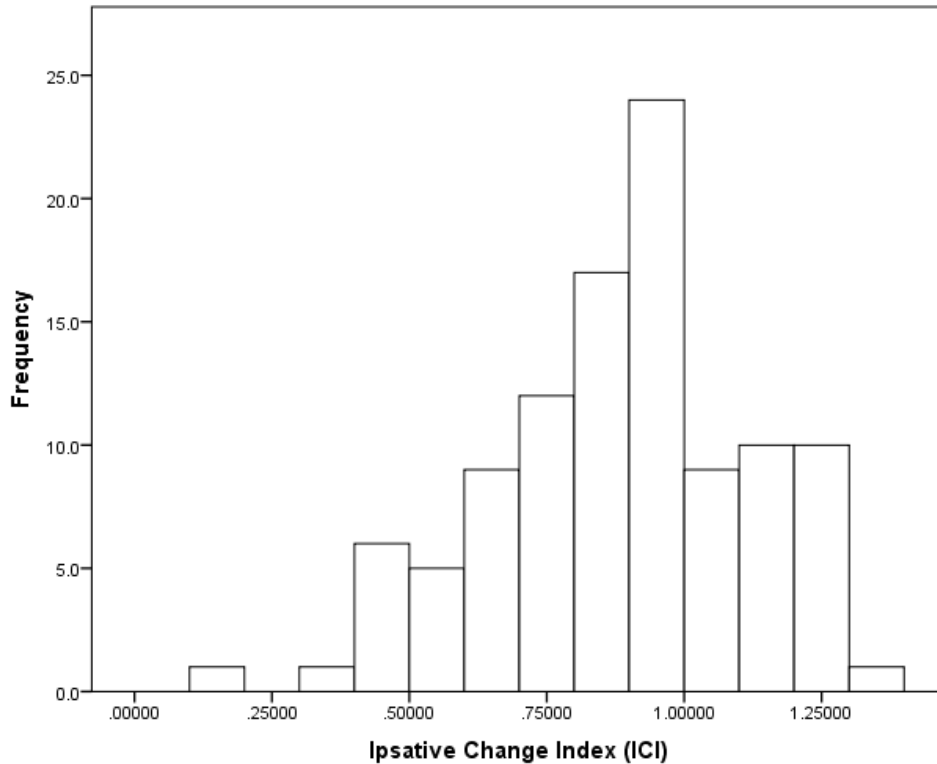


Figure 6.1. Ipsative change index as transformed with r to z Fisher.

Figure 6.2 shows the list and the frequency of stressful events experienced by the current sample between T1 and T2. None of the participants reported pregnancy, marriage or detention, and therefore these events are not included in figure. Only one person reported abortion; among the events closely related to university life, no person dropped a university course over his/her first year as an undergraduate. On the other hand, change in residence was the most frequent event reported, with 79.7% of individuals changing their address. The start of the academic year was also linked with changes in social activities for almost half of the current sample (49%), such as an intimate relationship breaking up (30.5%), and variations in usual sleep/wake rhythm (28%). Most importantly, 86.4% of the participants reported at least five events, thus giving an account of the multiple changes experienced by university newcomers.

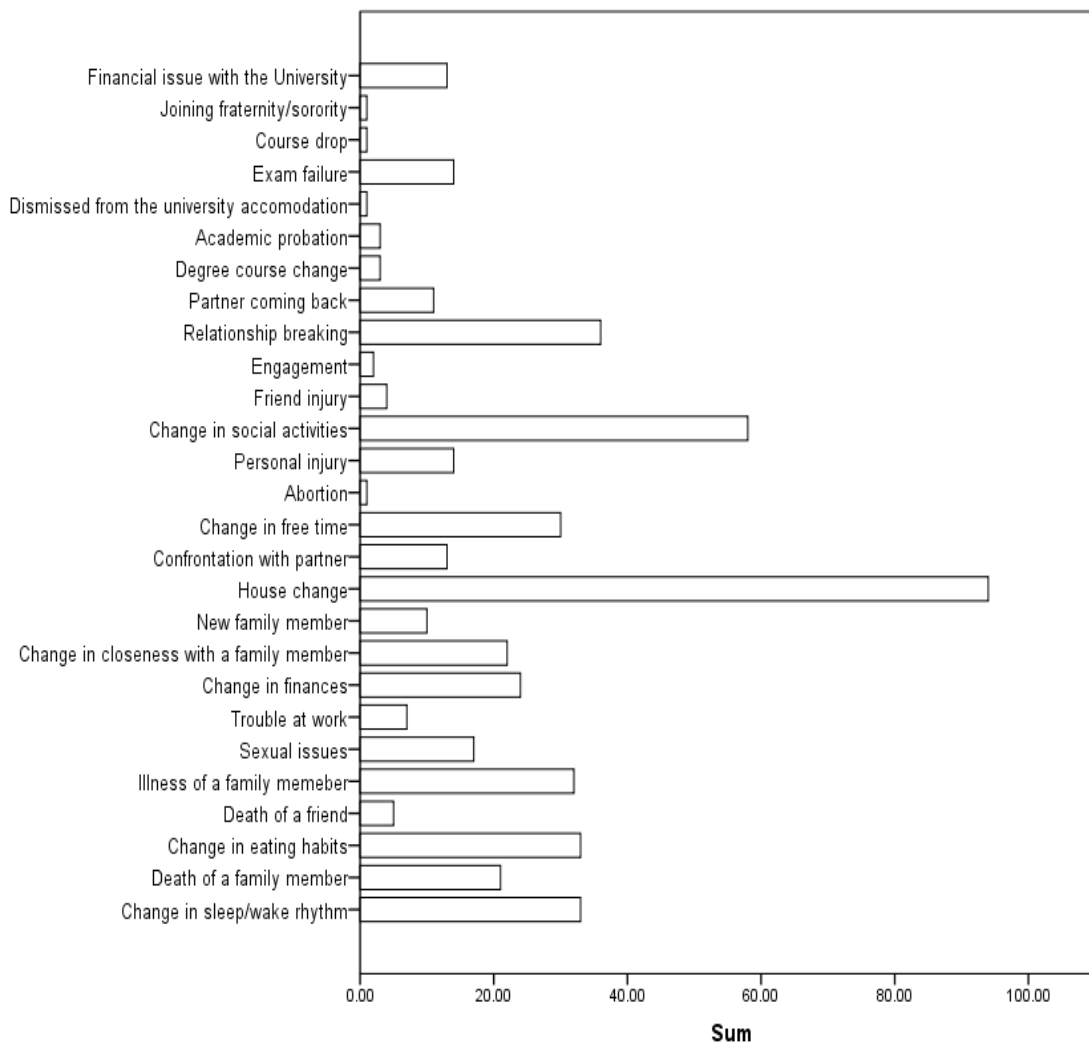


Figure 6.2. Frequency of Stressful events. Only events experienced by at least one participant were included.

Table 6.2 shows the zero order correlations based on the returning participants; stressful events were negatively associated with Neuroticism and Conscientiousness as well as Life satisfaction and Self-esteem, thus suggesting that frustrating events co-vary within personal characteristics and Self-discrepancy (read inverse self-agreement). Following these findings, a hierarchical multiple regression analysis was performed with the Life satisfaction scores at T1 entered in the first step, and stressful events entered in the second step as predictors for life satisfaction at T2. The results show that the number of stressful events experienced predicted Life satisfaction at T2, even when controlled for Life satisfaction at T1. Indeed, when the number of stressful events was

entered as a predictor at T2, ΔR^2 was .03 with $\Delta F(1,101)=58.01$, $p<.001$ at step 2. Additionally, standardised β was -.16, and $p<.05$. Only one participant was removed from the analysis because he was categorised as a univariate outlier with a $z=3.40$ on stressful events.

Although analysis of cross-sectional data at T2 is not a core aspect of this chapter, it is nonetheless interesting to check the association between implicit person theories and the other variable of interests, as proposed in Chapter 5 (see section 5.1 for the full list of hypotheses).

Both measures of implicit person theories were independent from the number of stressful events experienced and only the BIPT scores were associated with Big Five traits measures: namely, Extroversion and Openness. Despite the two measures of implicit theories still being strongly associated with one another, measures on the IPT were found to be independent from Self discrepancy, Self-esteem and Life satisfaction.

6.3.2. Replicability of personality prototypes

In order to replicate the prototypes extracted at T1, inverted factor analysis was performed on the returning participants. The procedure was the same as explained in Chapter 5 (section 5.2.4.1). The two prototypes extracted were highly correlated with those obtained at T1 ($r=.94$, $r=.95$, respectively, $p<.001$). Despite the high stability shown by the two prototypes (see Table 5.4 in Chapter 5 to see their content), implicit person theories showed low rank order stability and both Extroversion and Conscientiousness showed significant mean level variations. Table 6.3 and Table 6.4

Table 6.2

Zero order correlations of variables of interest at T2.

	1	2	3	4	5	6	7	8
1 Stressful events	-							
2 Extroversion	.12	-						
3 Agreeableness	-.07	-.09	-					
4 Conscientiousness	-.26**	.13	-0.05	-				
5 Neuroticism	.18*	-.11	0	-.01	-			
6 Openness	.08	.09	0	-.07	-.12	-		
7 Self-agreement	-.20*	.18	.20*	.37***	-.56***	.27**	-	
8 Self-esteem	-.32***	.30**	-.05	.24**	-.57***	.10	.56***	-
9 Life satisfaction	-.27**	.13	.13	.09	-.46***	.06	.38***	.61***
10 IPT	.07	.03	.09	-.03	-.01	-.04	-.05	.05
11 BIPT	.01	.36***	.11	.06	-.07	.22*	.31**	.27**

Note. n=118 *p<.05, **p<.01, ***p<.001.

show the relationships between personality traits, prototypes and implicit person theories as measured at T2. With respect to prototypes and personality traits (Table 6.3), the overall MANOVA model was significant with $F(1,114)=2726.02$ at $p<.001$, eta square=.49. Again, the two prototypes were inserted as independent variables. Similar to what was found at T1, a partial eta square showed that Affiliation oriented and Achievement oriented individuals differed most in terms of Extroversion and Agreeableness. Additionally, even at T2, Affiliation oriented individuals were high in Neuroticism but not any more in Conscientiousness.

Table 6.3

Mean, SD, F-ratio and eta square between prototypes and BFI traits

BFQ traits	M (SD)		F	p	Part eta.
	Affiliation	Achievement			
Extroversion	2.41 (.63)	3.55 (.71)	81.12	.001	.42
Agreeableness	3.77 (.60)	3.44 (.67)	7.45	.007	.06
Conscientiousness	3.47 (.70)	3.43 (.73)	0.08	.781	.01
Neuroticism	3.37 (.77)	3.03 (.76)	5.34	.023	.05
Openness	3.34 (.52)	3.52 (.70)	2.39	.125	.02

Note. n=116, n1=52, n2=64, df=1

Table 6.3 shows that Achievement oriented individuals at T2 showed increased Conscientiousness ($t=2.25$, $p<.05$,) whereas the affiliated group did not show the same increase ($t=0.47$, $p=.63$). Consequently, this finding shows that the mean change in Conscientiousness displayed by the whole sample can be further understood in the light of the increase showed by the Achievement oriented individuals.

As regards implicit person theories and self-concepts, Table 6.4 shows that Achievement oriented individuals were also characterised by stronger support for an incremental point of view, whether BIPT or IPT is considered. At T2, Achievement oriented individuals also showed higher levels of self-agreement, which is in line with their relatively high Self-esteem. Nonetheless, it seems that Life satisfaction was equal for both Affiliation oriented and Achievement oriented individuals, confirming the results from T1.

Table 6.4

Independent t-test based on prototypes.

Variable	M(SD)		t	p
	Affiliation	Achievement		
IPT	3.47 (.74)	3.79 (.94)	-2	.047
BIPT	3.98 (.51)	4.29 (.59)	-2.95	.004
Life satisfaction	5.33 (.74)	5.27 (.85)	.36	ns.
Self-esteem	2.86 (.57)	3.08 (.52)	-2.2	.03
Self-agreement ^{a, b}	.41 (.29)	.54 (.30)	-2.28	.025

Note. $n=116$, $N1=52$, $N2=64$, $df=114$. ^aInversed self-discrepancy.

^bScores are transformed using Fisher's r to z .

Table 6.5 shows that at T2 only Extroversion and Openness to Experience anticipated higher scores on the BIPT in a multiple regression (Method: ENTER). The overall model was significant at $p<.001$ with $F(1)=10.88$ and a total $R^2=0.16$. Due to sample size, the analysis was limited to the whole sample.

Similarly, a series of multiple regressions confirmed that support for an incremental theory of personality and self-agreement were both predictors of Self-esteem; in particular, Figure 6.3 shows that at T2, self-agreement mediated the

relationship between implicit person theories and Self-esteem (Baron & Kenny, 1986; Frazier et al., 2004)

Table 6.5

BIPT^a is regressed on personality traits.

Predictors	B	SE B	β	R2
Extroversion	.22	.06	.34**	.11
Openness	.17	.08	.19*	.05

Note. n=116. *p<.01, **p<.001. ^aHigher scores indicate support for incremental theory.

Four steps were performed to check this mediation. Initially, a simple regression analysis showed that support for an incremental person theory had a direct effect on scores of Self-esteem. Indeed, Self-esteem was also predicted by self-agreement, confirming previous findings in the field of self-concepts (Higgins, 1987). Third, self-agreement was regressed on BIPT, The final step involved a hierarchical regression analysis in which Self-esteem was entered as the outcome variable and BIPT was entered as a predictor in the first step ($F(1,116)=8.63$, $p<.01$ and $R^2=.07$). In the second step, self-agreement was entered a predictor ($F=(1,115)=27.86$, $R^2=.33$ and R^2 change=.26, $p<.001$). This final step showed that self-agreement mediated the relationship between BIPT and Self-esteem; In fact, after controlling for self-agreement, support for an incremental point of view no longer predicted higher levels of Self-esteem (see Figure 6.3).

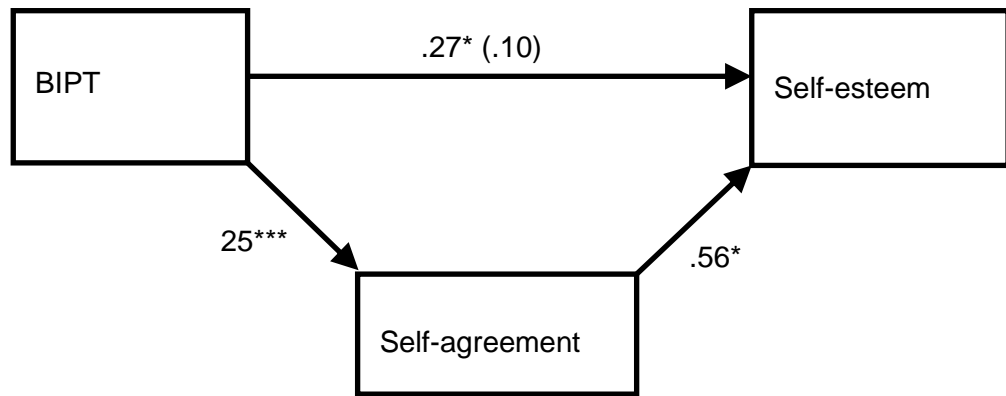


Figure 6.3. Self-agreement mediates the relationship between BIPT and Self-esteem.

As detailed by Petty (Rucker, Preacher, Tormala, & Petty, 2011), given that this non-significant coefficient is different from zero, it can be concluded that this is a partial mediation effect.

6.3.3. Personality change and implicit person theories; Hypothesis testing

Since Extroversion and Conscientiousness showed significant mean level change, attention was focused on the impact that implicit person theories could have in explaining the variations in these traits. A mixed ANOVA design was used to test H1; scores on Extroversion (T1, T2) were computed as a repeated measure and the BIPT (and the IPT) at T1 was inserted as a between subject measure. The BIPT was converted into a dichotomous variable because of the constraint imposed by SPSS v.21; the median split divided the participants between entity and incremental theorists. However, scores on Extroversion at T2 were not anticipated by support for an incremental theory. The interaction effect between time and implicit person theories was not significant, with $F(1)=.648$, $p=.423$, when the BIPT was considered. Similarly, non-significant results were found when the IPT scores were taken into account, with $F(1)=.946$, $p=.333$. As far as Conscientiousness is concerned, the same pattern emerged, with a non-significant interaction effect between scores on implicit person theories and Conscientiousness, whether BIPT $F(1)=.057$, $p=.813$ or IPT $F(1)= 1.014$,

$p=.316$ was considered. These results suggest that implicit theories do not give rise to self-reported personality trait changes, at least over the first year of university life in the sample of emerging adults studied here.

6.4. Discussion

The aim of the current chapter was to investigate personality change in a sample of emerging adults. In particular, longitudinal data were presented as the final part of the within-subject study. This discussion section is split into three main paragraphs; personality stability and change, cross-sectional data from T2, and finally the role of implicit person theories in personality trait change is treated. An additional paragraph is then devoted to the limitations of the current study and suggestions for future research directions.

6.4.1. Personality stability and change

On the whole, after one year, the current sample showed higher levels of stability as well as significant trait change, depending on the indicator considered. In fact, mean level, rank order and ipsative change were employed for this purpose. Despite the relatively short time window used, mean level differences revealed a significant increase in Extroversion and a decrease in Conscientiousness. With respect to Extroversion, previous research has not shown a consistent view, with some longitudinal studies finding that Extroversion did not vary during emerging adulthood (Roberts et al., 2006; Robins et al., 2005; Soto & John, 2012), and others suggesting that it diminishes over time after the teenage years (McGue, Bacon, & Lykken, 1993; Scollon & Diener, 2006). The current sample followed a different trend, although it should be noted that previous studies have often considered very large time windows which affects the opportunity to capture change related to specific life stages. It is also reasonable to expect that

universities' policies and investments in favour of communication, social activities and team work might foster change in this trait.

As regards Conscientiousness, the observed results appear to contradict previous findings in the field (Roberts et al., 2006), with Conscientiousness showing a decrease across the timepoints. In fact, it is usually expected that persons become more conscientious as they grow older; again this information is valid when the whole life-span is considered and the contradiction with previous research is only apparent. With the close look at emerging adults analysed here, this result can be framed as a peculiarity of this stage of life, in which responsibilities and duties are postponed in favour of identity exploration and social activities. However, when a person centred approach is considered, Achievement oriented individuals showed an increase in Conscientiousness, whereas Affiliated oriented individuals showed no change.

As far as rank order stability is concerned, all traits were highly stable, with Neuroticism showing the lowest coefficient (.75). Not surprisingly, these data reflected the trends already identified in previous studies (Roberts & DelVecchio, 2000).

The analysis of the ipsative index, here evaluated through Q-correlations, is perhaps a bit controversial, not only because ipsative change is not frequently used in mainstream research, but also because strategies used to calculate ipsative stability do vary across studies. In this sense, a study worth mentioning again is that of Robins and colleagues (2001) who obtained an ipsative index from the Big Five; those coefficients did show a rather strong stability, which is in line with our results. High ipsative stability was also found in previous studies based on ipsativity (Asendorpf & Van Aken, 2003; Block, 1971), although it should be noted that too often these studies have appeared to be concerned about the replication of a set of prototypes, rather than the observation of their change over time.

6.4.2. Prototype replication and cross-sectional data from T2

At T2, the two prototypes, Affiliation and Achievement oriented, were successfully replicated; additionally, a number of analyses examining the relationship between implicit person theories and personality traits were conducted in order to make comparisons with what was found at T1.

As far as personality traits and implicit person theories are concerned, the two tests employed for the assessment of implicit person theories, IPT and BIPT, showed different patterns with respect to the Big Five; in fact, the IPT measure showed no association with traits from the FFM at T2. In contrast, at T1, IPT scores were negatively associated with Neuroticism and positively associated with Agreeableness; despite the mean level stability of these two traits, at T2 the association was no more significant. This might be due to the relatively low rank stability of the IPT (.54), although the question remains partially unanswered. On the other hand, scores from the BIPT were found to be positively associated with Extroversion and Openness to Experience, thus confirming results from T1, although Conscientiousness was not more correlated with implicit theories. As regards the prototypes, at T2 IPT and BIPT were associated with the prototypes; Achievement oriented individuals were found to support an incremental view of personality attributes, whereas Affiliation-oriented individuals tended to subscribe to an entity point of view. Taken together, these findings confirm that implicit person theories and personality are not independent constructs; the belief that personal attributes are changeable goes together with a person keen to explore and re-frame reality in unconventional ways (Openness to Experience). Moreover, support for an incremental theory was also associated with higher scores on Extroversion, suggesting that the belief that attributes are changeable goes together with attention to an active and energetic life style, especially when Achievement oriented individuals are taken into account. In other words, highly extroverted individuals find particularly exciting the

acquisition of new skills which is in turn one of the main characteristics of incremental theorists (Dweck et al., 1995).

6.4.3. What causes personality change?

Finally, the role of implicit person theories in personality change was evaluated. It was hypothesised that support for an incremental personality theory would be associated with higher levels of personality change, that is, mean level, rank order and ipsative coefficient. The Big Five traits showed higher levels of stability and no ipsative change was found in the current sample, so the role of implicit person theories was assessed with respect to mean level variations in Extroversion and Conscientiousness. The results showed that support for an incremental point of view in personality did not contribute to mean level change in either Extroversion or Conscientiousness. Each analysis was repeated twice, once for each measure of implicit person theories.

6.4.4. General conclusion: Limitations and future directions

Several considerations should be noted in order to interpret the results and fully understand the contribution of the current project. First, due to the paucity of studies dealing with personality change in emerging adulthood, the results presented here should be considered as partially explorative. Given the several novelties introduced, both from a theoretical and a methodological point of view, more research is needed in order to compare and further test hypotheses and findings obtained from this sample. In particular, this study used a person centred approach to measure personality (by using prototypes) and to examine personality ipsative change. However, a comparison of ipsative continuity/change indices from different studies can be an issue since a variety of coefficients will have been used. Moreover, further research is also necessary to distinguish between ipsative stability and reliability, especially when prototypes are considered. As already noted, previous studies in the field have often focused on the

replication of prototypes rather than the detection of their development (Asendorpf & van Aken, 1999; Hart et al., 2003). In other words, it is essential to distinguish between true ipsative change and mere measurement error. In this respect, the two prototypes extracted from this sample need to be replicated with other samples and possibly with different Q-sort decks. In fact, the version of Q-sort employed for this study was specifically designed for non-professional sorters and it misses out some relevant features of a typical Q-sort deck. Usually, a Q-sort is based on a number of cards, each of which contains the description of a specific behaviour/context and hence better represents the socio-cognitive approach behind the method (Block, 2008, chapter 1).

As far as implicit person theories are concerned, the current study did not support the idea that the implicit theory endorsed by an individual has an impact on personality change, although the two constructs were associated. It might be that the influence of implicit person theories in personality change is not captured within the time window included in this study; future research could address this issue by following a sample over longer periods and with yearly assessments. In this way, it could be observed whether those persons who keep the same belief over time (such as incremental theory) do experience more trait change. However, despite the fact that neither the IPT nor the BIPT showed significant change (in mean level), rank order stability was rather low.

In conclusion, the main contribution of this project lies in the study of personality and personality change using multiple perspectives and with the focus specifically on emerging adulthood, which represents a critical stage in personality development, yet one relatively unattended to by current research. Indeed, throughout the combination of person and variable centred approaches, data were analysed and interpreted beyond the mere assessment of traits to recover the centrality of individuals in personality research (Block, 2010; King, 2010).

Chapter 7: Discussion

7.1 Introduction

The current project sought to investigate personality and personality change during emerging adulthood. A sample of emerging adults enrolled at a university for the first time was followed for thirteen months in order to examine personality change. Personality change was investigated using various indices (ipsative, mean level and rank order change) and multiple perspectives (variable centred and person centred measures of personality). The results have shown that significant personality change is possible, even during adulthood and even when a relatively short time between assessments is considered. Additionally, the role of implicit person theories (Dweck, 2000; Dweck & Leggett, 1988) in personality change was taken into account, in order to evaluate what causes change, beyond maturational processes.

This chapter is split into three parts, one for each theme proposed in this project: personality change, implicit person theories, and some considerations of the Q-sortware as a web tool for on line research. Each section includes a summary of the findings, their theoretical implications, some comments regarding limitations and suggestions for future research directions. Finally, general conclusions are drawn.

7.2. Personality change: Summary of findings and implications

The main aim of the current project was to investigate personality change in a sample of adults, with particular attention to emerging adults (Arnett, 2000) since this period of life is characterised by constant exploration of work preferences, intimate relationships and cultural beliefs (Arnett, 2007). Despite the relevance of this life stage, emerging adults are still under-represented in longitudinal studies and therefore one

contribution of this project was rooted in the attempt to analyse it as a separate stage of life, with its own distinctive features. In doing this, personality change has been examined with attention to a number of theoretical and methodological aspects.

First, from a theoretical perspective, this project acknowledged the dynamic nature of personality (Dweck, 1996; Shoda, LeeTiernan, & Mischel, 2002); personality assessment was achieved using both a variable centred and a person centred approach in order to recover the centrality of the individual. This was because over the past decades, personality psychology has often been reduced to the assessment of few abstracts traits, resulting in a loss of information (Block, 1995; McAdams & Olson, 2009; McAdams & Pals, 2006). The consequence of this at a methodological level is that both a Big Five test (the variable centred approach) and prototypes as obtained from a Q-sort (the person centred approach) were used to assess personality and personality change. This allowed the evaluation of change through ipsative, mean level, and rank order indicators. In terms of the variable centred perspective, a significant mean level increase in Extroversion and a decrease in Conscientiousness was found one year following the first wave of data collection (see section 6.3.1), confirming that personality change is possible beyond adolescence (Ardelt, 2000; Helson et al., 2002a; Robins et al., 2005; Soto & John, 2012) and even when the time window considered is relatively short. Despite the fact that high stability was found as far as rank order stability and Q-correlations are concerned, the two prototypes extracted (Achievement oriented and Affiliation oriented individuals) revealed additional information on personality change. In fact, Achievement oriented individuals experienced a significant increase in Conscientiousness whereas the generality of the sample involved showed the opposite pattern.

In terms of personality assessment, these results have contributed significantly to the debate concerning personality development (McAdams & Olson, 2009; Specht et al., 2011). Once again, these findings suggest that personality is not set like plaster, and

significant change can be detected beyond the adolescent years. In line with the theoretical conjectures proposed by Arnett (Arnett, 2006), the decade of emerging adulthood (age range 18 – 25) is characterised by strong instability, which motivates the increase in Extroversion and the change in Conscientiousness. Additionally, the use of a multi-perspective approach in the description of personality development highlighted information otherwise left unrevealed, thus confirming that personality is a complex construct that can hardly be described from one single perspective (Asendorpf, 2009). By combining the two methods, not only was an in-depth analysis of personality change achievable, but also, at the descriptive level, the individual differences and peculiarities of the people involved in the study (rather than variables) were clearly identifiable. The immediate advantage is that personality development can be described and explained beyond a superficial level of analysis (McAdams & Olson, 2009).

7.2.1. What causes change?

The current project attempted to place individuals in a place and time for an integrated and multi-perspective approach to personality. For this reason, this research was also interested in understanding why some people changed whereas others did not show the same pattern. As mentioned above, part of the mean level change described in section 6.3.1 can be explained in terms of intrinsic personality characteristics and contextual factors (Ozer & Benet-Martinez, 2006), in this case represented by Achievement oriented individuals, studied in a university context, who are constantly focusing their attention on a career and future job plans. Moreover, this research also considered two variables for the explanation of change in my sample: implicit person theories and a number of stressful events categorised as potentially detrimental for the individual (such as the death of a relative, significant financial change and so on, see Appendix D for the full list). As far as implicit person theories are concerned, the next section of this chapter deals with the association between implicit person theories and

personality at a descriptive level. Here, it is worth discussing the role played by implicit person theories in determining personality change, (see results in section 6.3.3). As stated in Chapter 6 (see section 6.1), it was hypothesised that holding an incremental belief about personal attributes (that is, personality) would elicit personality change. However, the results did not support this prediction, and despite the fact that the sample involved did report significant change in Extroversion and Conscientiousness, this change was not explained by support for an incremental perspective (see again, section 6.3.3). Therefore, I did not corroborate previous results from Robins and colleagues, who found that change in Openness to Experience and variations in Extroversion were due to support for a Growth mindset (Robins et al., 2005). Apart from the flaws and limitations affecting this study (see the following paragraph), it is possible that implicit person theories affect personality change only over longer periods (Blackwell et al., 2007).

Additionally, stressful events were also introduced as a variable of interest, although no specific hypotheses were offered in this respect. However, despite the role played by the number of stressful events reported by participants and their impact on Life satisfaction, Self-esteem, Neuroticism and Conscientiousness at T2, no personality change was explained by the experience of such events, and no association was found with implicit person theories. It should also be noted that the majority of stressful events reported by participants referred to common day-to-day issues rather than critical one-off events which could represent a turning point in the life of a person (Specht et al., 2011). In other words, experiencing frequent change of address (79.7%) or change in social activities as well as intimate relationships breaking up (49% and 30.5% of the sample involved respectively, see figure 6.2 in section 6.3.1) had a temporary effect on personality assessment.

7.2.2. Limitations and future directions

First, the results obtained from this sample should be replicated by others in order to reinforce the external validity of the findings reported here. This is necessary because the size of the sample studied here was not ideal, especially with respect to that part of the analysis related to a variable centred approach. In terms of representativeness, additional samples from other universities and other contexts should be studied in order to obtain data from emerging adults beyond the university environment. Moreover, future research would benefit from a careful consideration of socio-cultural aspects associated with personality and personality change (Taras et al., 2009). In fact, important features within emerging adults are strongly dependent on values and cultural issues that invariably influence decisions and future prospects beyond the age range considered with emerging adults in this study, which was 18 - 26. Arnett himself acknowledged that his findings are valid in a North-American context where the pressure to form a family and the stability obtained by a permanent occupation are less strong compared with other countries without an established university system (Arnett, 2006). Even so, modern societies in advanced countries are hardly defined by one homogeneous cultural group and therefore future research in this topic should fully acknowledge this diversity, well beyond the traditional multiple-choice question about ethnicity before the beginning of an experimental procedure (McAdams & Pals, 2006; Taras et al., 2009). One way to address this would be to examine personal values from a person centred perspective, in order to see whether sub groups of individuals within a population (that is, emerging adults) experience more change than others.

Another limitation concerned the duration of the current study. Following participants for longer periods (but still assuming to collect data yearly) would be advantageous in terms of the detection of personality change, especially considering

that recent evidence has suggested that change during adulthood does not follow a linear trend, at least as far as mean level change is concerned.

7.3. Implicit person theories and personality; Summary of findings

7.3.1. Implicit person theories and personality

7.3.1.1. Preliminary analysis

Another major theme of this current study involved the study of implicit person theories, sometimes referred to as implicit mindsets (Dweck, 2006). Implicit person theories concern naïve assumptions held by individuals in everyday life that personal attributes might be fixed (entity theory) or can be changed (incremental theory). Given the critical role played by this theory over the past decades, this work was interested in investigating whether support for an incremental theory about personality was associated with personality traits (the variable centred approach) as well as prototypes (the person centred approach) or independent from them, as proposed in section 5.1. In line with the expectations (see section 5.3.2), implicit person theories were found to be associated with personality traits (Chapters 4, 5 and 6) and significant association was found when personality was evaluated through prototypes, at least at T2 (see Chapter 6). In particular, in a study involving a sample from the generality of the population (see Chapter 4), it was hypothesised that support for an incremental point of view was positively associated with Extroversion, Openness to Experience and Conscientiousness (H1) and the results confirmed this hypothesis for the first two traits.

7.3.1.2. Implicit person theories and personality in a sample of emerging adults (T1).

In Chapter 5, the same hypothesis was tested again in a sample of emerging adults and with two separate measures for implicit theories. The first was the tool based on eight items already used in Chapter 4, and formerly suggested by Dweck and colleagues (Blackwell et al., 2007; Dweck & Leggett, 1988). This test asked participants

about the malleability of personality (see Appendix B for the full list of items). The results from this test partially confirmed H1 because it was found that personality traits and implicit person theories were associated (see again section 5.3.1). However, this association was not consistent with the expectations given that support for an incremental theory was associated with higher scores in Agreeableness and lower scores in Neuroticism rather than Extroversion and Openness to Experience. The second test for the assessment of implicit theories (the BIPT, see Appendix C for the full set of Items) was drawn from a previous study (Spinath et al., 2003) and was based on personal attributes taken from the FFM. When the BIPT scores were taken into account, H1 was fully confirmed. Additionally, a regression analysis suggested that scores on Extroversion, Conscientiousness and Openness to Experience predicted support for an incremental theory. At the exploratory level, it was also considered specific groups of individuals as portrayed by prototypes (Achievement oriented and Affiliation oriented individuals) obtained through Q-sort, although the Achievement oriented and Affiliation oriented individuals did not significantly differ in terms of implicit theories. Nonetheless, when a regression analysis was conducted on sub-samples of the two prototypes, scores on the BIPT were predicted by Extroversion and Openness to Experiences only for Affiliation oriented individuals, whereas when Achievement oriented individuals were taken into account, support for an incremental person theory was predicted by higher scores on Agreeableness, Conscientiousness and Openness to Experience (See Table 5.7 in section 5.3.2.).

7.3.1.3. Implicit person theories and personality traits at T2.

In Chapter 6 (T2), H1 was investigated again, exactly as stated in Chapter 5. When the scores on the IPT were considered, support for an incremental point of view was not associated with any personality trait, whereas H1 was fully confirmed when the BIPT was taken into account, with both Extroversion and Openness to Experience

significantly associated with support for an incremental person theory. In addition, at T2 the prototypes differed significantly in terms of implicit person theories; Affiliation oriented individuals appeared to be linked with support for an entity theory whilst Achievement oriented individuals were tied to support for an incremental theory.

These results are partially in contrast with those of the only previous study which directly compared implicit person theories and personality traits (Spinath et al., 2003); in fact, even if those authors found modest yet significant associations between support for an incremental person theory and Conscientiousness, Extroversion and Openness to Experience, they concluded that the implicit person theories are independent from personality traits. Taken together, these results suggest the opposite notion, not only when a sample from the generality of the population was used (Chapter 4) but also when a sample of emerging adults was followed over time (see the results discussed in Chapter 5 and Chapter 6).

7.3.2. Implicit person theories and self-concepts

It was hypothesised that support for an incremental point of view was positively associated with higher levels of Self-esteem and Life satisfaction (see H2 in Chapter 4, H2 in Chapter 5 and section 6.3.1 in Chapter 6). This was because previous research had posited the idea that support for an incremental theory helps to maintain Self-esteem while the implicit belief that personal attributes and personality are unchangeable is detrimental to Self-esteem and Life satisfaction (Beer, 2002; Heslin, 2003; Hong, Chiu, Dweck, Lin, & Wan, 1999; Kasimatis et al., 1996; Robins & Pals, 2002). This hypothesis was tested and then confirmed in a sample taken from the general population (Chapter 4). In Chapter 5, the same hypothesis (see section 5.1, H2) was tested again and then confirmed in a sample of emerging adults (age range 17 – 26) regardless of the measure for implicit theory considered (both IPT and BIPT). In Chapter 6, these results were partially confirmed, with Life satisfaction completely

independent from implicit person theories (BIPT and IPT), while Self-esteem was positively associated with support for an incremental point of view but only when the scores on the BIPT were taken into account.

In order to understand the relationships between implicit person theories with the other variables, the relationship between implicit person theories and Self-discrepancy was analysed, since previous studies had found that support for an incremental person theory moderated the already existing negative relationship between Self-esteem and Self-discrepancy (see H2b as stated in Chapter 5, section 5.1; Renaud & McConnell, 2007). However, neither in Chapter 5 (T1 of the longitudinal project) nor in Chapter 6 (T2) was H2b confirmed. Rather, support for an incremental person theory was directly associated with lower levels of Self-discrepancy and higher Self-esteem, but no moderating effect was found. In Chapter 6, when scores from the IPT were considered, no association was found with Self-discrepancy, nor with Self-esteem, whereas the BIPT scores showed the opposite pattern, confirming the results obtained at T1. Unlike what was hypothesised in H2b, at T2 (Chapter 6, section 6.3.2) support for an incremental point of view (BIPT only) appeared to mediate (rather than moderate) the relationship between Self-esteem and Self-discrepancy. A series of regressions showed that after controlling for Self-agreement, support for an incremental point of view no longer predicted scores of Self-esteem.

7.3.3. Implications, limitations and future directions: Implicit person theories, personality and self-concepts

Over the past decades, implicit theories have become a relevant construct in various fields of psychology (Dweck, 2000, 2008). In particular, developing an incremental point of view has been proposed as a strategic choice in educational programmes for primary and secondary schools in order to encourage academic achievement and develop motivation (Blackwell et al., 2007; Dweck, 2006). Similarly, companies and enterprises encourage their employees to develop a growth mindset

(that is, incremental theory) in the light of the advantages documented by research in terms of productivity and career satisfaction (Heslin, 2003; Heslin & VandeWalle, 2008; Heslin et al., 2006). The results from this research suggest that developing an incremental point of view elicited motivation and drove adjustment, especially when a person is particularly extroverted and open to new experiences. Taken together, these traits recall the concept of plasticity (DeYoung, 2006) which previous literature had linked to motivation and adjustment and therefore reinforcing the notion that, after all, implicit person theories are essentially about motivation. Nonetheless, even the most powerful world-view varies its impact according to the personality of the individual who is embracing that view. So individual differences should be taken into account in those programmes and training sessions dedicated to the development of a growth mindset. Additionally, more research is needed in order to understand whether personality traits elicit the development of an incremental point of view or *vice versa*. Perhaps an answer to this question can come from the use of person centred approaches; in this sample, for instance, Achievement oriented individuals developed an incremental point of view over time, perhaps implying that motivated individuals maintained their commitment by holding a Growth mindset so as to achieve satisfactory results at the end of their degree course. In this sense, another study should investigate implicit person theories in association with the final mark obtained at the end of a degree course together with the actual choices made by participants in terms of career and job plans.

From a methodological point of view, several limitations and points of improvement are recommended for future research in the area of study which this project has addressed. First, more attention should be paid to the measure of implicit person theories. These results and conclusions are mainly dependent on a test (the BIPT) of which the psychometric structure could be strongly improved; in fact, more analysis is needed to address the issue of how many factors constitute implicit person theories, and whether other implicit theories beyond the dichotomy proposed

(incremental versus entity) are available to individuals or not. Indeed, this study employed two separate measures for implicit theories in the domain of personality and they were found to be moderately correlated with one another ($r=.46$ at T1 in chapter 5 and $r=.44$ at T2, in Chapter 6 both with $p<.001$). This led to the conclusion that the two tools explored the same domain from two different perspectives, although both were associated with personality.

7.4. Q-sortware; A tool for research in quantitative and qualitative research

The creation of the Q-sortware as a web tool for research is another original contribution of the present work. In Chapter 4, research was conducted in order to compare and validate an on-line version for the use of the Q-sort method. The on-line version of the Q-sortware reproduced all the features of the paper version, such as obtaining a description from a close friend, which is easily done via the web. However, despite the many applications available for on-line surveys, only a few web applications allow a researcher to administer the Q-sort. Among these, even fewer are able to collect data using a procedure with both a Likert scale test and Q-sort; additionally, these web applications are often not updated with the operating systems currently available for PCs and laptops, and obtaining an account and/or information on how to use the software was troublesome. For all these reasons, over the course of the current project, the initial version of the Q-sortware was updated in order to allow the creation of separate accounts and a web site (<http://www.qsortware.com>: information on how to open an account can be found at account@qsortware.com) was created in order to promote the web application on-line. Nonetheless, the Q-sortware is completely free and it is hoped that it will support other academic researchers. Although almost no investment has been planned to advertise the software, students at various levels as well as professors and researchers across the world are currently using the Q-sortware as a tool for their research, and the growing interest is encouraging the creation of an international

community which is using the Q-sort method in psychological science. This is because traditional Likert-scale tests as well as Q-sort can be easily administered in a single procedure, with a very user-friendly interface, tailored for the need of a specific research programme and, broadly, particularly suitable for longitudinal studies. Our ambition is that the Q-sort as a technique for person centred approaches will be perceived as a credible option for everyone who is approaching the study of personality. Even so, in research studies in which the Q-sort is involved, participants are rarely required to complete other tests because the paper version of the Q-sort is often time-consuming, especially when the version employed is based on several cards each of which contains long sentences which require a lot of attention from participants (Block, 2008). With the Q-sortware used in this current study, a drag-and-drop function allowed the completion of very long procedures in a reasonable amount of time and without any loss of attention. In fact, each participant completed the procedure in less than an hour, even though several tests were involved. In the future, we plan to allow researchers to design their own experiments using an even wider variety of response formats, including open questions and semi-structured interviews, in order to enlarge the range of options currently available.

7.5. General conclusion

The current project sought to investigate personality and personality change in a sample of emerging adults. Additionally, the role of implicit person theories was also considered in determining personality change. The results supported the notion that personality change is always possible even after adolescence and even when a relatively short time window is considered, thus encouraging the consideration that personality is a complex and dynamic construct rather than an immutable object. Moreover, this thesis strongly re-considered the study of personality using a multi-perspective approach in which traits are only a part of personality assessment rather

than the only option for the description of an individual. As a person is always placed in a given time and context, personality assessment and research should always acknowledge these sources of information. Whilst it was interested in a fruitful description of an individual with the support of both a person centred (Q-sort) and a variable centred approach to personality, this thesis has renewed interest in a socio-cognitive view of a person in order to recover the centrality of an individual in personality research. In doing this, the association between personality and implicit person theories has been clarified, suggesting that not only is support for an incremental point of view associated with Extroversion and Openness to Experience, but also that, over time, this association tend to cluster with specific sub-groups of individuals, as shown by the Achievement-oriented individuals identified in our sample. Support for an incremental point of view in personality was also found to be associated with higher levels of subjective well-being indicators, here represented by Self-esteem and Life satisfaction. With the use of the Q-sortware for data collection, this project also encourages further research to improve designs with the use of software applications in order to save time and to enable effective protocol administration.

Appendices

Appendix A

Adjective Q-sort (AJQ). List of adjectives (Block, 2008). See the two screenshots on the following two pages for the response format (the boxes) used for the initial and the second sorts.


1. Energetic, active.
2. Adventurous.
3. Affectionate, loving.
4. Assertive.
5. Ambitious, like(s) to do well.
6. Calm, relaxed.
7. Wise.
8. Competitive, Like(s) to win.
9. Considerate, thoughtful.
10. Critical.
11. Cheerful.
12. Curious, questioning.
13. Self-centred.
14. Self-controlled.
15. Generous.
16. Shy.
17. Creative, imaginative.
18. Independent.
19. Purposeful.
20. Orderly, neat.
21. Sociable.
22. Rebellious.
23. Reasonable, logical.
24. Reserved.
25. Responsible.
26. Restless, fidgety
27. Self-confident.
28. Like(s) to be in the center of attention
29. Stubborn.
30. Sympathetic.
31. Talkative.
32. Worrying, fearful.
33. Feminine.
34. Competent.
35. Distractible.
36. Sensible.
37. Obedient.
38. Impulsive.
39. Approval seeking.
40. Trusting.
41. Get(s) upset easily.
42. Masculine.

Participants were asked to sort each adjective into three boxes (see the Figure below). They were then asked to refine their sort.

Personality study / Step 9 of 10...

Drag the following item into one of the boxes below:

Undesirable (unlike my ideal self)	Neutral	Desirable (matches my ideal self)
1 Energetic, active. 1	1 Adventurous. 2	1 Affectionate, loving. 3
2 Ambitious, like(s) to do well. 5	2 Assertive. 4	2 Calm, relaxed. 6
3 Wise. 7	3 Competitive, like(s) to win. 8	3 Considerate, thoughtful. 9
4 Critical. 10	4 Curious, questioning. 12	4 Self centered. 13
5 Cheerful. 11	5 Generous. 15	5 Shy. 16
6 Self controlled. 14	6 Independent. 18	6 Purposeful. 19
7 Creative, imaginative. 17	7 Reasonable, logical. 23	7 Sociable. 21
8 Orderly, neat. 20	8 Restless, fidgety. 26	8 Reserved. 24
9 Rebellious. 22	9 Stubborn. 29	9 Self-confident. 27
10 Responsible. 25	10 Talkative. 31	10 Sympathetic. 30
11 Like(s) to be in the center of attention. 28	11 Worrying, fearful. 32	11 Competent. 34
12 Obedient. 37	12 Feminine. 33	12 Distractible. 35
13 Masculine. 42	13 Impulsive. 38	13 Sensible. 36
	14 Trusting. 40	14 Approval seeking. 39
		15 Get(s) upset easily. 41

Continue 

Screenshot A1. Initial sort for the description of the ideal self. The key word for the actual personality description was Characteristic'


Personality study / Step 9 of 10...

Here you have the chance to refine your sorting **ABOUT YOUR IDEAL SELF**. Please drag the label into the appropriate box. Make sure to fill each box with the required number of labels indicated by the brackets.

Drag the items to the boxes below:

Undesirable (unlike my ideal self)	Neutral	Desirable (matches my ideal self)
	1 Adventurous. 2	1 Sympathetic. 30

Least desirable (3)	Quite undesirable (5)	Somewhat undesirable (8)	Relatively neutral (10)	Somewhat desirable (8)	Quite desirable (5)	Most desirable (3)
1 Wise. 7 2 Cheerful. 11 3 Creative, imaginative. 17	1 Rebellious. 22 2 Orderly, neat. 20 3 Responsible. 25 4 Obedient. 37	1 Critical. 10 2 Energetic, active. 1 3 Like(s) to be in the center of attention. 28 4 Masculine. 42 5 Competitive, like(s) to win. 8 6 Curious, questioning. 12 7 Independent. 18	1 Ambitious, like(s) to do well. 5 2 Self controlled. 14 3 Reasonable, logical. 23 4 Generous. 15 5 Stubborn. 29 6 Assertive. 4 7 Feminine. 33 8 Impulsive. 38 9 Worrying, fearful. 32	1 Trusting. 40 2 Considerate, thoughtful. 9 3 Self centered. 13 4 Sociable. 21 5 Reserved. 24 6 Shy. 16 7 Self-confident. 27 8 Competent. 34	1 Purposeful. 19 2 Sensible. 36 3 Distractible. 35 4 Get(s) upset easily. 41 5 Approval seeking. 39 6 Calm, relaxed. 6 7 Affectionate, loving. 3	
OK!	1 item(s) missing	OK!	OK!	OK!	Too many items	3 item(s) missing

Continue 

Screenshot A2. Second part of the Q-sort. Participants were asked to refine their initial sort

Appendix B

Full set of items used for the assessment of implicit theories in the domain of personality (Dweck & Leggett, 1988). See the screenshot on the following page.

Participants were asked to express their agreement/disagreement with eight sentences using a 6 point Likert scale; 1 'Strongly disagree', 2 'Disagree', 3 'Mostly disagree', 4 'Mostly agree', 5 'Agree' and 6 'Strongly agree'. Items marked with an asterisk were reversed and averaged with the items assessing an incremental theory.

1*. A person is defined about something basic about them which cannot be changed.

2*. People can do things differently, but the important part of who they are, can't really be changed.

3*. Everyone is a certain kind of person and there is not much that they can do to really change that.

4*. As much as I hate to admit, you can't teach an old dog a new trick. People can't really change their deepest attribute.

5. Everyone, no matter who they are, can significantly change their basic characteristic.

6. People can substantially change the kind of person they are.

7. No matter what kind of person someone is, they can always change very much


8. People can change even their most basic quality.

Personality study / Step 7 of 10...

Test

Below, you have several sentences about your attitude toward change. Again, tick the box in order to indicate your level of agreement with every statement.

Statement	Strongly disagree	Disagree	Mostly disagree	Mostly agree	Agree	Strongly Agree
1 A person is defined by something basic about them, which cannot be changed	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2 People can do things differently, but the important part of who they are can't really be changed	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3 Every one is a certain kind of person and there is not much that they can do to really change that.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4 As much as I hate to admit, you can't teach an old dog new tricks. People can't really change their deepest attribute	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5 Every one, no matter who they are, can significantly change their basic characteristic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6 People can substantially change the kind of person they are	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
7 No matter what kind of person someone is, they can always change very much	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
8 People can change even their most basic quality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Continue 

Screenshot B1. Directions (top) and test for the assessment of implicit person theories (IPT)

Appendix C

The full set of items used for the assessment of implicit theories in the domain of personality (Spinath et al., 2003). See the screenshot in the following page. Participants were asked to express their agreement/disagreement with eight sentences using a 6 point Likert scale; 1 'Strongly disagree', 2 'Disagree', 3 'Mostly disagree', 4 'Mostly agree', 5 'Agree' and 6 'Strongly agree'. Items marked with an asterisk were reversed and averaged with the items assessing an incremental theory. The words are taken from the FFM, italics added.

1. How *reserved* you are as a 'person' is hardly changeable by yourself.
2. How *sociable* you are as a 'person', depends mainly on your effort.
3. How *shy* you are as a 'person', cannot be influenced by yourself.
4. If someone is not very *talkative* as a child, he or she cannot be *talkative* as an adult either, even if he or she tries to.

5. How *trusting* you are as a 'person' is hardly changeable by yourself.
6. How *forgiving* you are as a 'person', depends mainly on your effort.
7. How *rude* you are as a 'person', cannot be influenced by yourself.
8. If someone is not very *bossy* as a child, he or she cannot be *bossy* as an adult either, even if he or she tries to.

9. How *lazy* you are as a 'person' is hardly changeable by yourself.
10. How *tidy* you are as a 'person', depends mainly on your effort.
11. How *distracted* you are as a 'person', cannot be influenced by yourself.
12. If someone is not very *disciplined* as a child, he or she cannot be *disciplined* as an adult either, even if he or she tries to.


- 13 How worrying you are as a 'person' is hardly changeable by yourself.
14. How *relaxed* you are as a 'person', depends mainly on your effort.
15. How *melancholic* are as a 'person', cannot be influenced by yourself.
16. If someone is not very *emotionally stable* as a child, he or she cannot be *emotionally stable* as an adult either, even if he or she tries to.
-
17. How *open to new experiences* you are as a 'person' is hardly changeable by yourself.
18. How *inventive* you are as a 'person', depends mainly on your effort.
19. How *active* your imagination is, cannot be influenced by yourself.
20. If someone is not very *emotionally stable* as a child, he or she cannot be *emotionally stable* as an adult either, even if he or she tries to.

Personality study / Step 8 of 10...

Test

Here there is a second set of statements about your attitude toward change. Again, simply read each sentence and tick the appropriate box in order to explain your agreement or disagreement with every statement

Statement	Strongly disagree	Disagree	Mostly disagree	Mostly agree	Agree	Strongly agree
1 How reserved you are as a 'person' is hardly changeable by yourself	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2 How sociable you are as a 'person', depends mainly on your effort	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3 How shy you are as a 'person', cannot be influenced by yourself	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4 If someone is not very talkative as a child, he or she cannot be very talkative as an adult either, even if he or she tries to	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5 How trusting you are as a 'person' is hardly changeable by yourself	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6 How forgiving you are as a 'person', depends mainly on your effort	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7 How rude you are as a 'person', cannot be influenced by yourself	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8 If someone is not very bossy as a child, he or she cannot be very bossy as an adult either, even if he or she tries to	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9 How lazy you are as a 'person' is hardly changeable by yourself	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10 How tidy you are as a 'person', depends mainly on your effort	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11 How distracted you are as a 'person', cannot be influenced by yourself	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12 If someone is not very self disciplined as a child, he or she cannot be very self disciplined as an adult either, even if he or she tries to	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13 How worrying you are as a 'person' is hardly changeable by yourself	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14 How relaxed you are as a 'person', depends mainly on your effort	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15 How 'melancholic' you are as a 'person', cannot be influenced by yourself	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16 If someone is not emotionally stable as a child, he or she cannot be emotionally stable as an adult either, even if he or she tries to	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17 How open to new experiences you are as a 'person' is hardly changeable by yourself	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18 How inventive you are as a 'person', depends mainly on your effort	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19 How active your imagination is, cannot be influenced by yourself	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20 If someone is not very curious as a child, he or she cannot be very curious as an adult either, even if he or she tries to	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Continue 

Screenshot B1. Directions (top) and test for the assessment of implicit person theories (BIPT).

Appendix D

The full list of events chosen for the longitudinal study as proposed by participants (Gothelf, Aharonovsky, Horesh, Carty, & Apter, 2004; Sarason et al., 1978). Participants were asked to report whether any of these events had (Yes) or had not (No) happened to them in the thirteen months since the completion of the first part of the experiment (T1).

1. Marriage.
2. Detention in jail or in comparable institution.
3. Major change in sleeping habits (much more or much less sleep).
4. Death of a close family member.
5. Major change in eating habits (much more or much less food intake).
6. Death of a close friend.
7. Male: Wife/girlfriend's pregnancy.
8. Female: Pregnancy.
9. Serious illness or injury of a close family member.
10. Sexual difficulties.
11. Trouble with employer (in danger of losing job, being suspended, demoted, etc.).
12. Major change in financial status (a lot better off, a lot worse off).
13. Major change in closeness of family members (decrease or increase).
14. Gaining a new family member (through birth, adoption, family member moving in, etc.).
15. Change of residence.
16. Major change in number of arguments with a spouse (a lot of more or a lot more less).
17. Major change in usual type and/or amount of recreation.
18. Male: Wife/girlfriend's having abortion.

19. Female: Having abortion.
20. Major personal illness or injury.
21. Major change in social activities.
22. Serious injury or illness of close friend.
23. Engagement.
24. Breaking up with girlfriend/boyfriend.
25. Reconciliation with girlfriend/boyfriend.
26. Change to a new school at the same academic level (undergraduate, graduate, etc.).
27. Academic probation.
28. Being dismissed from dormitory or other residence.
29. Failing an important exam.
30. Failing a course.
31. Dropping a course.
32. Joining fraternity/sorority.
33. Financial problems concerning school (in danger of not having sufficient money to continue).

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