  
 **The Relationship Between Adult Attachment Orientation and Mindfulness and Their Role in Student Psychological Well-being**

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# Thesis abstract

Adult attachment security and trait mindfulness are associated with the same positive mental health outcomes, including greater psychological well-being, and are both associated with adaptive responses to stressful and emotional experiences. In light of the similarities researchers have theorised that the relationship between these two variables is bidirectional. However, very little work has examined either the directionality of, or causality within, their relationship and how they influence psychological well-being. This is the topic of this thesis.

A systematic review and meta-analysis was conducted to establish the extent and nature of the relationship between adult attachment orientation and mindfulness (Chapter 2). In an attempt to understand the possible mechanisms that link these constructs, the second study (Chapter 3) examined whether emotion regulation might account for the commonalities between the two constructs. This work is located in the applied context of mental well-being in higher education.

The second half of this thesis attempts to address issues of directionality and causality in the relationship between attachment orientation and mindfulness. The third study (Chapter 4) presents longitudinal data determining the stability of attachment and mindfulness over time, the predictive nature of each construct on the other, and the relevance of both constructs in student psychological well-being. The fourth study (Chapter 5) examined the causal relationship between attachment orientation and mindfulness by manipulating each construct in a laboratory setting, and assessing change in the other. Together, this doctoral thesis provides evidence to refute popular theory concerning the relationship between attachment orientation and mindfulness, suggesting their relationship is not bidirectional. It argues that attachment orientation plays a causal role in mindfulness, but that the reverse is not true. These novel findings advance greatly our understanding of the relationship between these traits and highlight important contributions from both constructs to the mental well-being of undergraduate students.

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**Chapter 1. General Introduction**

# 1.1. Introduction

According to attachment theory (Bowlby, 1969), adult attachment orientation, a trait-like pattern of affect regulation strategies, develops as a reflection of the sum total experiences of being cared for in close relationships (Ainsworth, Blehar, Waters, & Wall, 1978; Brennan, Clark, & Shaver, 1998). These caregiving experiences directly shape and influence our internal working model of the self, others, and relationships (Bowlby, 1969, 1973) which guide the way we experience and deal with stress or threat (Bowlby, 1982; Waters et al., 2002). Internal working models can be described as pathways of cognitive structures that reflect the cumulative perceptions of our personal experiences with past attachment figures (Collins, Guichard, Ford, Feeney, 2004). Internal working models influence information processing and interpersonal functioning, including attitudes, emotions, affect regulation, and behavioural strategies (see Mikulincer & Shaver, 2007; Shaver & Mikulincer, 2002 for review). More broadly, internal working models influence the way we attend to and perceive information (Rowe & Carnelley, 2003)– from both internal and external sources.

In recent years, a burgeoning literature has studied the benefits of enhanced attention, perception, and awareness of internal and external stimuli, through focusing on mindfulness and mindfulness practice. Mindfulness is defined as the self-regulation of attention and the acceptance of one’s immediate experiences (Kabat-Zinn, 1994). This awareness is said to emerge through sustained, non-judgmental attention in the present moment (Kabat-Zinn, 2003). Brown and Ryan (2003) argued that mindfulness could be considered a “naturally occurring characteristic” with inter- and intra-personal variations. Individual differences exist in both levels of mindfulness and the capacity for mindfulness (Brown & Ryan, 2003) and researchers have posited attachment theory provides an appropriate conceptual framework to examine and understand these differences (Shaver, Lavy, Saron, & Mikulincer, 2007).

Research has begun to document the associations between attachment orientation and mindfulness, although it is still largely unknown how the general level of and capacity for mindfulness develops. Current work in this area has tended to focus on the possibility of a bidirectional relationship to explain the similarities and associations between these constructs (Ryan, Brown, & Creswell, 2007). Therefore, this doctoral work aims to examine and delineate the relationship between the two constructs, which recent studies have begun to explore (Pepping, Davis, & O’Donovan, 2015).

Initially, this doctoral work began by conducting a systematic review and meta-analysis of all available literature, to establish the extent and nature of the relationship between the two constructs (Chapter 2). Findings indicated that there is a clear significant relationship between attachment orientation and mindfulness, with attachment anxiety and avoidance being associated with lower levels of total mindfulness. Next, the thesis presents an exploratory examination of the relationship between attachment orientation, mindfulness, and emotion regulation, to examine whether emotion regulation might account for the commonalities between the two constructs (Chapter 3). In this study, as a secondary research topic, the core constructs of interest (attachment and mindfulness) are also related to the outcome variable of mental well-being in the context of Higher Education (HE). Intention to drop out of university features as a concrete example of coping in this context. While the results of this study suggest that emotion regulation may indeed by a commonality between attachment and mindfulness, the directionality of their relationship still needed to be addressed.

Therefore, Chapter 4 presents a longitudinal study to determine the stability of attachment orientation and mindfulness over time, as well as the stability of their associations, and the predictive nature of each construct on the other. Following on from the contextual research topic established in the previous chapter, the relevance of attachment orientation and mindfulness in predicting student mental-health and intention to drop out of university were also examined. The key findings from this work were that, over time, attachment anxiety is predictive of some facets of mindfulness, but the reverse is not true. Additionally, attachment orientation was found to be predictive of emotion regulation strategies, coping behaviours, and some facets of psychological well-being while mindfulness was predictive of perceived stress.

Following on from the findings presented in Chapter 4 suggesting a directional relationship, whereby attachment orientation in some way precedes trait mindfulness, the final study examined the causal nature of the relationship between attachment and mindfulness by manipulating each construct in a laboratory setting, utilising a novel attachment security prime (Chapter 5). Using a rigorous repeated measures design, comparisons were made between the effects of an attachment security prime, a mindfulness induction, and a control condition on state attachment orientation and state mindfulness. Priming attachment security increased state mindfulness of mind (cognitive experiences) to a greater degree than a mindfulness induction or control, and improvements in state attachment were moderated by attachment avoidance. Regarding the contextual topic of student mental-health, intent to drop out of university was measured pre/post each experimental condition. Findings indicated that priming attachment security significantly reduces drop out intent. Finally, the General Discussion draws together the key messages from this body of work, namely, that (i) attachment orientation and mindfulness are consistently associated; (ii) the relationship between these constructs may not be bidirectional as previously suggested, but rather, attachment anxiety is predictive of some facets of mindfulness, but the reverse is not true; (iii) both constructs contribute to the mental well-being of undergraduate students; and (iv) priming attachment security is more effective at increasing state mindfulness compared to a mindfulness induction. Findings are discussed in relation to the advancement of theory and the potential practical implications.

The remainder of this introductory chapter will outline the main tenants of attachment theory and discuss these in relation to attachment orientation in adulthood. Next, both mindfulness and mindfulness practice will be outlined, followed by the associations between these constructs, their similarities and beneficial outcomes, and popular theories attempting to delineate their relationship. Finally, the contextual research topic of this thesis will be introduced: mental well-being and dropout in higher education, and the potential importance of adult attachment orientation and mindfulness to this applied setting.

# 1.2. Attachment Theory

The development of attachment theory can be attributed to Bowlby (1969, 1973, 1980) who proposed that the infant attachment system is rooted in a genetic, evolutionary, emotional, and behavioural system that influences the infant to bond, or form an attachment, to its primary caregiver in order for survival (Bowlby, 1969). He argued that infants are born with a range of innate behaviours (attachment behaviours) aimed at seeking and maintaining proximity to their attachment figures. Further to this, he purported that the attachment system was not only vital to survival, but also to physical, cognitive, and emotional development (Bowlby, 1969).

Bowlby stated that children learn, in infancy, how to function through their early interactions with primary caregivers (1980). A main focus within attachment theory is the quality of the relationship between the infant and their primary caregiver/attachment figure. The attachment figure is understood to serve two important functions in that they provide: (i) a ‘safe haven’ to which the infant can turn for comfort in times of threat or distress and (ii) a secure base for exploration of the environment. Infants use the information they receive from their caregiver, most notably responsiveness and warmth, to create internal working models, or representations, of the self, others, and relationships which they then use to deal with stressors (Bowlby, 1982; Waters et al., 2002). When faced with immediate threat or distress, an infant employs attachment behaviours in an attempt to increase proximity and, subsequently, safety.

Building on Bowlby’s work, Ainsworth and colleagues (1978) delineated individual differences in the development and functioning of the attachment system, as a response to the quality of care received. Such differences have been extensively researched in developmental psychology (e.g., Leerkes, Blankson, & O’Brien, 2009). In their seminal work, Ainsworth and colleagues (1978) identified three distinct patterns of attachment in infants: secure, anxious-ambivalent, and anxious-avoidant. These patterns were observable in the Strange Situation Procedure (SSP) – a lab based stress induction whereby the infant is separated from the caregiver for short periods in a standardised procedure. The secure pattern reflects an optimal functioning of the attachment system, recognising their attachment figure as a source of comfort which develops as a result of caregivers being sensitive and responding appropriately to their needs. In the SSP, infants exhibiting a secure attachment displays signs of distress when separated from their mother and also used their mother as a secure and safe base to explore their environment. The secure pattern represents the antithesis of the two insecure patterns of attachment. The anxious-ambivalent attachment pattern develops in response to uncertainty about the caregiver’s availability and responsiveness – resulting in the infant exhibiting greater anxiety including intense distress, discomfort around strangers, and not easily placated or comforted. The anxious –avoidant pattern develops in response to a rejecting caregiver. In the SSP, avoidant infants display little concern when separated from their caregiver, avoiding them upon their reunion.

Within the SSP, Ainsworth encountered difficulties fitting all infant behaviour into the three classifications of infant attachment. Drawing on the records of behaviours, Main and Solomon (1990) added the fourth category – disorganised attachment. These infants exhibit a wide range of “odd” and “out of context” behaviours not seen in other groups including misdirected or jerky movements and, in some cases, apparent dissociations (Main & Solomon, 1990). At times these behaviours can be fleeting, immediately followed by ordinary attachment behaviour. This disorganisation is thought to develop as a result of fear without solution by which the attachment figure acts as a source of fear, overloading or “flooding” the attachment system resulting in a disruption of proximity seeking behaviours (Main & Solomon, 1990).

There is a strong body of literature establishing the link between attachment security in early childhood and positive adaptations in adulthood (e.g., Hazan & Shaver, 1987; Rothbard & Shaver, 1994), as well as associations between attachment insecurity and various maladaptive behaviours (e.g., Erikson, Sroufe, & Egeland, 1985; Grossmann & Grossmann, 1991). Along with the argument that the quality of our early relationships becomes a model for relationships later in life, Bowlby also posited that negative working models tend to persist due to their pervasive influence on perceptions of new relationships (1988). That is to say, the organisation of the attachment system early in life is considered a strong predictor for functioning in adulthood.

## 1.2.1. Attachment in Adulthood

There are two distinct schools of thought on adult attachment. Firstly, the developmental tradition places a focus on adults’ mental representations of their childhood experiences and relationships with caregivers and their patterns of caregiving towards their own children (e.g., Ainsworth, 1979; Bowlby, 1988; George & Solomon, 1996). Secondly, the personality, or social-cognitive, tradition focuses on working models of current relationships, including romantic partners (e.g., Hazan & Shaver, 1987, 1990). The two traditions differ in the way in which they assess adult attachment (see Shaver & Mikulincer, 2010 for review). The former uses narrative assessments such as interviews and pictorial description tasks designed to access unconscious processing (e.g., George, Kaplan, & Main, 1996) whereas the latter utilises self-report questionnaires and experimental methodologies (e.g., Brennan, Clarke, & Shaver, 1998). This thesis draws from the personality/social-cognitive model of adult attachment, and as such, research from the developmental tradition will not be discussed at length in what follows.

Current conceptualisations of adult attachment orientation from a personality or social-cognitive perspective focus on the two dimensions of attachment insecurity: anxiety about abandonment and avoidance of intimacy (Brennan, Clark, & Shaver, 1998). When individuals have repeated experiences with responsive and warm care givers who are attentive to their needs, they score low in both attachment anxiety and avoidance. This reflects a secure attachment orientation that is characterised by a balanced approach to support seeking and affect regulation. An individual’s attachment needs are not denied or suppressed, nor are they overwhelming.

The two dimensions of insecurity represent different organisational qualities of the aforementioned attachment system. Individuals who have experienced caregivers who are inconsistently available and responsive score high in attachment anxiety (Bowlby, 1969, 1973). Attachment anxiety and a high desire for proximity seeking is believed to result in a hyperactivation of the attachment system. This hyperactivation is characterised by intensive proximity seeking, a hypersensitivity to signs of rejection and abandonment, along with excessive rumination on one’s shortcomings and threats to immediate relationships (Mikulincer & Florian, 1998). These individuals hold a positive view of others but view themselves as flawed and less worthy of love and comfort than others (Bartholomew & Horowitz, 1991). In contrast, those who experience caregivers that are consistently rejecting or non-responsive have internalised the experience that seeking proximity fails to soothe, and they score high in attachment avoidance. Attachment avoidance is believed to result in a deactivation of the attachment system. Individuals high in avoidance distance themselves from individuals that are likely to activate the attachment system. This deactivation is characterised by an avoidance of proximity seeking, denial of attachment needs, and the suppression of signs of vulnerability (Mikulincer & Shaver, 2003). This typically results in a diminished capacity to develop intimate relationships (Hazan & Shaver, 1994). These individuals possess a negative model of others, viewing others as untrustworthy or not dependable and view themselves as either positive or negative (Bartholomew & Horowitz, 1991).

These two dimensions of attachment insecurity are said to underlie the universal patterns of thoughts, behaviours, and feelings that occur within the context of relationships. Preceding the development of this dimensional approach to individual differences in attachment orientation (Brennan & Shaver, 1995), Hazan and Shaver (1987) conceptualised romantic love as an attachment process and reasoned that the individual differences present in adults’ orientations towards loving relationships may well indeed resemble those individual differences in infant attachment patterns. Consistent with this, Simpson, Collins, Tran, and Haydon (2007) found that one’s attachment orientation in infancy predicted the emotional quality of romantic relationships in early adulthood.

More recently, another dimension of adult attachment orientation has been proposed – disorganised attachment (Paetzold, Rholes, & Kohn, 2015). This is characterised by a fear of romantic partners which can be attributed to the traditional dimensions of anxiety and avoidance. The term “fear” is used to refer to a fear of abandonment in attachment anxiety and a fear of intimacy in attachment avoidance (Paetzold et al., 2015). This fear is said to be embedded in the individual’s working model and generalised across all attachment figures, remaining stable over time (Paetzold et al., 2015). The fear of abandonment, expressed by those exhibiting greater attachment anxiety, manifests as approach behaviours, to seek support from an attachment figure. In avoidant individuals, fear of intimacy leads to distancing behaviours, as a means of self-protection against abandonment and rejection (Paetzold et al., 2015). Because these individuals face the unique, and complex, situation of attachment relationships being the source of fear and comfort, they exhibit confused and contradictory behaviour. These individuals will attempt to seek out and approach their attachment figure as a source of comfort but these approaches remain incomplete and appear chaotic due to their simultaneous fear of the attachment figure (Paetzold et al., 2015). Although isolated in its measurement, the construct of disorganised attachment is viewed not as an independent attachment orientation. In infancy, it is believed to coexist alongside anxious-ambivalence and anxious-avoidance (Main & Solomon, 1990). Due to the relatively recent availability of the Adult Disorganized Attachment scale (Paetzold et al., 2015), there is a paucity of research on disorganisation in adulthood. However, early indications are that it may be an important factor in psychological outcomes (Shearman, Millings, Carroll, & Rowe, 2019). As such, consideration of this construct features in Chapter 3 of this thesis.

**1.2.2. Attachment Orientation and Well-being**

Traditionally, attachment theory has been used as a framework for understanding a wide range of facets of interpersonal functioning that directly influence the quality of close relationships. However, research has also focused on the association between attachment anxiety and avoidance and their implications on personal well-being and psychological functioning (Carnelley, Pietromonaco, & Jaffe, 1994; Cooper, Shaver, & Collins, 1998). Diener and Seligman (2002) found that close relations significantly contribute to happiness, suggesting that the ability to form and maintain close relationships with others may have significant implications for well-being. Various research studies have provided evidence to support the idea that a secure adult attachment orientation contributes to a sense of well-being. More specifically, adult attachment security has been positively associated with positive affect (Toraquati & Raffaelli, 2004), well-being (Leak & Cooney, 2001; La Guardia, Ryan, Couchman, & Deci, 2000), decreased depression (Ciechanowski, Sullivan, Jensen, Romano, & Summers, 2003) and adaptive coping behaviours (Brennan & Shaver, 1995). There is also extensive research into the relationship between attachment security and positive affect. Mikulincer and Florian (1998) detailed the positive associations between attachment security and psychological well-being amongst community and lab-based samples. They reported attachment security was associated with adaptive coping and emotional reactions to a variety of stressors while attachment insecurity negatively affects the same reactions, suggesting stable and satisfying relationships to be an important resilience factor (Mikulincer & Florian, 1998).

Attachment insecurity, on the other hand, is associated with a myriad of maladaptive outcomes. Throughout attachment theory it is generally understood that repeated interactions with inconsistent, unreliable, and/or insensitive attachment figures disrupts the development of a secure attachment orientation and, subsequently, a stable mental foundation. Attachment insecurity (high anxiety and/or avoidance) can also have detrimental effects by reducing resilience in coping with stressful life events and leave individuals vulnerable to psychologically break down in times of severe stress or crisis (Bowlby, 1988). Williams and Riskind (2004) reported the associations between higher attachment insecurity, increased psychological symptoms, greater cognitive vulnerabilities, and greater general relationship impairments. Therefore, attachment insecurity can be conceptualised as a vulnerability to mental ill-health and deficits in psychological well-being.

Shaver and Hazan (1994) postulated that, as in infancy, attachment insecurity (greater anxiety and/or avoidance) in adulthood places individuals at risk of being ill-equipped to cope with stress. Research has documented the associations between attachment insecurity and both maladaptive and dysfunctional coping behaviours (Brennan and Shaver, 1995; Mikulincer, Florian, & Weller, 1993; Mikulincer, 1998; Pistole, 1995, 1996). Individuals endorsing greater attachment anxiety or avoidance have been found to adopt emotion-focused and distancing forms of coping behaviours to deal with stress (Mikulincer & Florian, 1995; Ognibene & Collins, 1998). Other studies have detailed the associations between attachment security and less physiological arousal when faced with stressful events (e.g., Feeney & Kirkpatrick, 1996). While individuals endorsing a secure attachment orientation are able to acknowledge negative emotions without becoming overwhelmed by them, those with an insecure attachment orientation tend to feel overwhelmed by the arousal of negative affect (anxiety) or distance themselves from emotionally charged material (avoidance; e.g., Fraley, Garner, & Shaver, 2000; Fraley & Shaver, 1997, 1998).

Mikulincer and Shaver (2013) detailed the “healing benefits” of attachment security. They postulated that, in comparison with the risks presented by attachment insecurity, creation, maintenance, or restoration of a sense of attachment security should, overall, improve mental health. As discussed previously, the attachment literature has detailed the associations between supportive attachment figures and the development of a sense of safety, positive emotions, and resilience to appropriately deal with stressors and challenging situations. Although inner working models are resistant to change, research has highlighted the malleability of inner working models over time and the ability to shift attachment insecurity towards security, among other positive life adaptations (see Gillath, Selcuk, & Shaver, 2008 for review). Researchers have induced state changes in attachment in the lab utilising priming methods which will be fully discussed in Chapter 5.

In recent years, a number of mediators have been identified in the link between attachment security and positive life adaptations. Specific to this body of work include, but are in no means limited to: reflective functioning (Fonagy, Steele, Steele, Moran, & Higgitt, 1991; Fonagy, Steele, Steele, Higgitt, & Target, 1994), reflective capacity/observing (Ma, 2008), emotional awareness (Mallinckrodt & Wei, 2005); and affect regulation strategies (Wei, Vogel, Ku, & Zakalik, 2005). Previous research has shown that these constructs mediate the relationship between attachment security and adaptive functioning (e.g., Wei et al., 2005). Such associations imply that the influence attachment security has on optimal psychological functioning and well-being lies in the facilitation of cognitive and affective balances. Two critical functions of mindfulness are to facilitate cognitive and affective balances in individuals (Wallace & Shapiro, 2006; Siegel, 2007). The development of mindfulness is believed to reduce cognitive deficit (absent mindedness), hyperactivity (confusing reality with fantasy), and dysfunction (misapprehension of events). Mindfulness is also thought to effectively address affective imbalances such as affective deficit (emotional numbness or indifference), hyperactivity (excessive emotional reactivity), and dysfunction (inappropriate emotional responses) (Wallace & Shapiro, 2006). Therefore, it is not without reason to suggest there is considerable overlap between the aforementioned mediators and the characteristics of the mindfulness construct.

# 1.3. Mindfulness

## 1.3.1. Overview of Mindfulness

Mindfulness has deep historical roots in Buddhism and the notion of mindfulness is embedded in the practice of meditation, a term used to refer to varying mental and emotional control practices. Meditation can be defined further as a form of mental training aimed at improving core psychological capacities, including attentional and emotional self-regulation (Tang, Holzel, & Posner, 2015). There are two major classes of meditation practice: concentration meditation and mindfulness meditation (Goleman, 1976). These methods differ in the way in which attention is utilised with concentration methods involving the restriction of attention to a single point or object while mindfulness meditation emphasises the detached observation from one moment to the next (Kabat-Zinn, 1982).

The concept of mindfulness meditation was introduced to Western Psychology during the mid-twentieth century (Cardaciotto, 2005). Throughout the 60’s and 70’s the study of meditation gained traction in experimental psychology and, when objectively measured using electroencephalogram (EEG), was found to produce a discrete altered state of consciousness (Banquet, 1973; Tart, 1972). In light of this, two meditative states were uncovered by experimental psychologists and were associated with either: a) concentrative approaches (see Anand, Chhina, & Singh, 1961); or b) mindfulness approaches (see Kasamatsu & Hirai, 1966). Concentrative approaches are characterised by, at resting state, persistent alpha activity with increased amplitude modulation during meditative practices which could not be blocked by sensory stimuli (Anand et al., 1961). However, individuals engaging in mindfulness approaches demonstrated brief periods of alpha blocking and did not habituate to distractions suggesting they experience each intrusion as if it were being experienced for the first time (Kasamatsu & Hirari, 1966). In a systematic review, Lomas, Ivtzan, and Fu (2015) found no consistent patterns were observed in respect to beta, delta, and gamma bandwidths but rather increased alpha and theta power, signifying a state of relaxed alertness.

Accumulating physiological evidence for the effects of mindfulness meditation on enhancing awareness and a decentred experience of the present moment kick started the study of mindfulness more broadly by psychologists. In other words, mindfulness went mainstream, and began to be examined and applied as a secular practice. Soon after, mindfulness entered into the field of social psychology, conceptualised initially as a trait. Langer’s (1989) ground breaking work defined mindfulness as one’s ability to draw novel distinctions, which increases one’s awareness of different perspectives of the same object or event. However, she placed an emphasis on active cognitive operations from external stimuli and creation of new categories, whereas the present definition of mindfulness emphasises an open, undivided observation of what is occurring externally and internally rather than cognitive approaches to external stimuli (Brown & Ryan, 2003).

### 1.3.2. Mindfulness as a Trait

It is important to delineate between the construct of mindfulness as a measurable trait, generally defined as a pervasive and enduring tendency in behaviour (Zuroff, 1986), and state mindfulness, predominantly accessed during mindfulness meditation, which involves the cultivation of mindfulness (Brown, Ryan, & Creswell, 2007a). One of the core characteristics of mindfulness is open, or receptive, awareness and attention (Deikman, 1982; Martin, 1997), said to emerge through sustained attention, in the present moment, non-judgmentally (Kabat-Zinn, 2003). Although dispositional mindfulness can be increased through mindfulness-based training (e.g., Baer et al., 2008; Falkenström, 2010), research has also detailed the individual differences in mindfulness capacity amongst those with no previous meditation experience (Brown, Ryan, & Creswell, 2007b; Cordon & Finney, 2008; Walach, Buchheld, Buttenmüller, Kleinknecht, & Schmidt, 2006). Throughout the literature these individual differences have been assessed utilising self-report measures (see Sauer et al., 2013 for review) as well as electroencephalographic (EEG), event-related potential (ERP), and neuroimaging techniques (see Cahn & Polich, 2006 for review).

Research has found that individuals exhibiting greater dispositional mindfulness report feeling less stressed, anxious, and depressed, and more hopeful, content, and satisfied with life (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006; Brown & Ryan, 2003; Cardaciotto, Herbert, Forman, Moitra, & Farrow, 2008; Feldman, Hayes, Kumar, Greeson, & Laurenceau, 2007; Walach et al., 2006). Those individuals exhibiting greater dispositional mindfulness have also been found to better regulate their sense of well-being through emotion awareness, understanding, acceptance, and the ability to alter unpleasant mood states (Baer et al., 2008; Brown et al., 2007; Feldman et al., 2007). Being in a mindful state, even momentarily, is associated with a greater sense of well-being (Lau et al., 2006). This ability to regulate internal emotional experiences in the present moment is arguably beneficial for overall mental health.

### 1.3.2.1. Definitions of Mindfulness

Several definitions of the construct of mindfulness have been proposed throughout the literature, which are all individually relevant to describing this dispositional trait. Here, I delineate two different conceptualisations, as these directly feed into the measures used throughout this thesis.

### *1.3.2.1.1. Bishop’s Two Component Definition*

Bishop et al. (2004) proposed an operational, two-component definition of mindfulness comprised of *Self-Regulation of Attention* and an *Orientation to Experience*. The first component, Self-Regulation of Attention, involves bringing awareness to current experiences, observing and attending to changes in one’s field of thoughts, and is maintained in a way that allows for a heightened recognition of mental events (Bishop et al., 2004). They described mindfulness as beginning by bringing one’s awareness to current experience, observing and attending to changing feelings, sensations, and thoughts leading to a feeling of being very alert in the present moment. They argued that the ability of sustained attention is critical in the maintenance of awareness of current experience. A key component of mindfulness is a sustained attention to any present moment experience (e.g., sound or physical sensation) which keeps attention anchored in the present moment enabling feelings, sensations, and thoughts to be detected in one’s stream of consciousness. Within this self-regulation of attention is the flexibility and ability to switch focus from one object to another (Posner, 1980). Additionally, the self-regulation of attention includes a non-elaborative awareness of feelings, sensations, and thoughts as they arise, rather than engaging in ruminative thought patterns about one’s experiences. Instead, mindfulness emphasises the direct experience of events, in the present moment, of the mind and body (Teasdale, Segal, Williams, & Mark, 1995). Thoughts and events in the mind may be considered objects of observation, which contrasts with supressing such thoughts or being distracted/absorbed by them (Bishop et al., 2004).

The second component in this definition is the Orientation to Experience, which is adopted and cultivated in mindfulness meditation practice (Bishop et al., 2004). All feelings, sensations, and thoughts that arise are initially considered equally relevant and therefore subject to observation. Emphasis is placed on noticing each feeling, sensation, or thought that enters the stream of consciousness. A position of acceptance, being experientially open to the present moment, is taken towards one’s experience (Bishop et al., 2004; Roemer & Orsillo, 2002). Resulting in the cultivation of an open and receptive attitude to whatever occurs in one’s field of awareness.

Authors, including Bishop et al. (2004) emphasise the importance of discriminating between outcomes of mindfulness practice and elements of the construct of mindfulness. Specifically, Bishop et al. (2004) discussed the suitability of examining non-reactivity and compassion as elements of mindfulness practice rather than characteristics of dispositional mindfulness. Further to this, Bishop and colleagues (2004) argued the importance of operational definitions of mindfulness for the development of valid measures of the processes involved in mindfulness practice.

### *1.3.2.1.2. Baer’s Five Facets of Mindfulness*

Researchers have argued the importance of measuring complex constructs at the facet level so as to clarify the relationships between these constructs and other variables (e.g., Smith, Fischer, & Fister, 2003). Investigating the construct of mindfulness at the facet level is not only likely to improve our understanding of the specific skills that are cultivated through mindfulness practice but also how they are associated with psychological adjustment (Baer et al., 2006).

Seeking to unpack and understand the construct of mindfulness further, Baer and colleagues (2006), utilized factor analysis to investigate the underlying structure of five previously developed self-report mindfulness questionnaires. The results of this analysis led to the proposal of five individual facets of dispositional mindfulness (Baer, Smith, & Allen, 2004; Baer at al., 2006, 2008) and, subsequently, the Five Facet Mindfulness Questionnaire (FFMQ; Baer et al., 2006). This self-report measure assesses trait mindfulness across five individual subscales: *Acting with awareness* includes attending to one’s activities of the present moment and can be contrast with behaving mechanically while attention is focused elsewhere (also known as *auto pilot*); *Observing* is the noticing or attending to internal and external experiences, including sensations, cognitions, emotions, sounds, and smells; *Describing* refers to the ability to label internal experiences with words; *Non-judging of inner experience* is holding a nonevaluative stance towards one’s thoughts and feelings; *Non-reactivity to inner experience* is the tendency to allow thoughts and feelings come and go, the ability to experience them without the need to immediately respond and without getting caught up or carried away by them.

While Bishop et al. (2004) emphasised the importance of discriminating between outcomes of practicing mindfulness and elements of the mindfulness construct, their conceptualisation of mindfulness remains broad. Baer and colleagues (2006), however, delineate the construct of mindfulness further, assessing and investigating the individual differences of this construct. Such a comprehensive measurement of mindfulness is favourable when examining the relationship between adult attachment and mindfulness and their roles in psychological well-being.

## 1.3.3. Mindfulness Practice

There is a growing body of literature that examines the benefits of greater mindfulness and engaging in mindfulness practice. More recently, research has begun documenting the relationships between mindfulness practice, increases in mindfulness, and the benefits for both mental and physical health (see Crowe, Jordan, Burrell, Jones, & Gillon, & Harris, 2016; Gu, Strauss, Bond, & Cavanagh, 2015 for review). Greater mindfulness capabilities have been linked to the reduction of stress, stress-related medical symptoms, and also with the enhancement of positive emotions and quality of life (Carmody & Baer, 2008; Lindsay et al., 2018).

Research supports the idea that cultivating greater attention, awareness, and acceptance through mindfulness practice is associated with lower levels of psychological distress, such as lower anxiety, stress, depression, anger, and worry (e.g., Baer, 2003; Brown et al., 2007; Greeson & Brantley, 2008). Studies have also elucidated the way in which mindfulness practice/training reduces stress. Specifically, Carmody and Baer (2008) found that the longer spent engaging in formal meditation practices (such as body scan, yoga, sitting meditation) led to increased mindfulness and psychological well-being, and reduced psychological distress. A randomised controlled trial amongst university students showed that 4 weeks of mindfulness training reduced stress by decreasing ruminative thinking, a cognitive process associated with depression (Jain et al., 2007). Further to this, another study found that 8 weeks of mindfulness training significantly reduced rumination in individuals with a history of clinical depression (Ramel, Goldin, Carmona, & McQuaid, 2004). Collectively, these studies highlight a salutary mechanism of mindfulness following mindfulness practice, that mechanism being the reshaping of maladaptive ways of thinking, which subsequently improves and promotes emotional well-being. Research has also documented that increasing state mindfulness over repeated sessions of mindfulness practice may contribute to increased trait mindfulness (Kiken, Garland, Bluth, Palsson, & Gaylord, 2016).

Mindfulness practice has been shown to exert influence on areas of the brain associated with the regulation of attention, awareness, and emotion (e.g., Cahn & Polich, 2006). These findings evidence that the repeated use or enhancement of these mechanisms at a state level have lasting effects and lead to an increase in trait mindfulness. Following an 8-week mindfulness training programme, when compared to a control group, led to a significant increase in the participants’ ability to orient attention to the present moment (Jha, Krompinger, & Baime, 2007). Although, significant changes have been documented in shorter time-periods. In another study, when compared with a relaxation control group, a 5-day mindfulness training programme significantly improved executive attention efficiency (Tang et al., 2007). Overall, this research indicates that mindfulness training, or repeated practice, can lead to real and lasting changes in trait mindfulness.

This influence is further supported by the use of brain imaging techniques. Not only has research reported significant differences in neural activity between concentration and mindfulness meditation (e.g., Dunn, Hartigan, & Mikulas, 1999) but has documented the unique brain activity associated with dispositional mindfulness. In particular, researchers found that individuals exhibiting greater dispositional mindfulness appear to have a greater ability to control emotional reactions in the amygdala and dorsal anterior cingulate cortex by engaging the prefrontal cortex, most often associated with attention and emotion regulation (Creswell, Eisenberger, & Lieberman, 2008; Creswell, Way, Eisenberger, & Lieberman, 2007). Following an 8-week mindfulness-based stress reduction (MBSR) programme, changes were documented in the prefrontal cortex consistent with experiencing positive emotions (Davidson et al., 2003). One structural magnetic resonance imaging (MRI) study into mindfulness practice reported that experienced mindfulness meditators, compared to matched controls, had increased grey matter in regions of the brain that are typically activated during meditative practice (Hölzel et al., 2007).

### 1.4. Associations Between Adult Attachment and Mindfulness

Ryan and colleagues (2007) first delineated three points of contact between adult attachment security and mindfulness. These points of contact were later expanded upon by Shaver, Lavy, Saron, and Mikulincer (2007).

While mindfulness can be categorised as an inherent capacity (e.g., Brown & Ryan, 2003) it is also subject to developmental influences. Individuals who grow up with loving and autonomy-supporting caregivers may have every opportunity to develop mindful awareness. The development of reflective, self-observing capacities are further facilitated by caregivers who can be attuned to, and resonate with, the infant’s experiences, thus fostering the infant’s developing capacities for awareness (Ryan et al., 2007). Research has documented that children who experience more attentive, sensitive, and accepting caregivers develop greater reflective and regulative skills (Fonagy & Target, 1997). Conversely, those infants who experience threatening and unsupportive environments are compromised in the development in the aforementioned capacities, with early experiences having lasting effects on subsequent development. Simply put, those who experience attentive and responsive caregiving are likely to be more securely attached and more mindful/have a greater propensity for mindfulness (Ryan et al., 2007).

The second connection between these two constructs argued by Ryan and colleagues (2007) is the possibility of them being related bidirectionally. Specifically, attachment security is thought to foster greater attentiveness to relational partners (see Shaver et al., 2007), with the current literature suggesting that mindfulness is related to attachment security in adulthood (e.g., Cordon & Feeney, 2008). On the other hand, they proposed that mindfulness may facilitate secure attachment through an open and receptive attention to relationship partners (Ryan et al., 2007; c.f. Carson, Carson, Gil, & Baucom, 2004; Hodgins & Knee, 2002).

Thirdly, both constructs of mindfulness and attachment security have been documented as contributing to a range of positive outcomes. As detailed in the attachment theory literature, those individuals with a secure attachment possess the resources required for approaching, and dealing with, stress (e.g., Mikulincer & Florian, 1998). Being in a position to utilise an arsenal of adaptive resources, it is not necessary for these individuals to rely on psychological defences aimed at distorting perception, limiting coping flexibility, or generating interpersonal conflict (Mikulincer & Shaver, 2007). Ryan and colleagues argued that these adaptive qualities of attachment security appear to be fostered by mindful-states, where one is open to experience and attentive to external and internal stimuli, less prone to distortions of reality, and possibly less prone to conflict (2007). Alongside diminished threat appraisal and enhanced affect regulation, attachment security and mindfulness have also been associated with greater emotional availability, enhanced self-regulation, greater relationship quality, and pro-social attitudes and behaviours (see Brown et al., 2007 for discussion). These points of contact between attachment theory and mindfulness, and the evidence for them, is more fully discussed in Chapter 2.

The beneficial outcomes associated with attachment security and mindfulness are likely to render an individual more resilient (i.e. less vulnerable) to mental ill-health and threats to psychological well-being. In turn, such individuals ought to be better able to cope with stressful situations. By way of examining this issue, this thesis examines the role of mindfulness and attachment orientation in the psychological well-being of students, operationalising ability to cope with stress as the simple, real-world variable of intent to drop out of university. Due to the focus on this contextual narrative of the present thesis, the remaining sections of the present chapter discuss student well-being, and attachment orientation and mindfulness in relation to it.

## 1.5. Mental Well-being and Retention in Higher Education

According to the most recent data, in the 2017/2018 academic year there were an estimated 1.8 million undergraduate students enrolled in university courses across the UK, with an average of 6.3% of students no longer in HE in their entry cohort (HESA, 2019). Student psychological well-being is an important issue of growing interest on a global scale. In the last 10 years, mental health disorders and difficulties have been as prevalent among undergraduate students as their non-student counterparts (Blanco et al., 2008). Marking a milestone of independence for most, entering university may be the first time an individual takes full responsibility for their health and well-being as they take on roles of autonomy and personal responsibility.

Student life can be exciting and challenging as students are fully immersed in academia while still trying to find their footing socially, geographically, and financially (Kawase et al., 2008). Continual changes in HE within the UK arguably contribute to elevated levels of stress. Increasing student fees and the financial burden of loans replacing living allowances sees more students combining study with paid employment to ease financial pressures, often to the detriment of their education (National Union of Students, 2017). Subsequently, it is not surprising that contemporary students in the UK face stressors beyond the “traditional” stressors associated with pursuing HE (such as exam pressure and coursework deadlines, e.g., El Ansari et al., 2011). Research has shown that the transition into university is associated with documented increases psychological disturbance and absent mindedness (Broglia, Millings, & Barkham, 2017; Fisher & Hood, 1987; Macaskill, 2012). Additionally, Tinto (1993) reported the transition to higher education to be a significant predictor of university achievement – with 75% of non-progressing students attributed first year difficulties to dropping out. The issues of elevated stress and subsequent psychological detriments are not limited to UK students. Research has long documented that the undergraduate mean stress levels exceed those of the general population in Canada (Adlaf, Gilksman, Demers, & Newton-Taylor, 2001), the United States (Sax, 1997), and also Sweden (Vaez, Kristenson, & Laflamme, 2004). However, Broglia and colleagues (2017) found that UK students had greater clinical severity for symptoms when compared to US students, highlighting the severity of student mental health in HE.

## 1.5.1. Attachment Orientation and Undergraduate Student Mental Health

Adult attachment theory has emerged as an important framework for understanding the mental health needs of undergraduate students (e.g., Lopez, Mitchell, & Gormley, 2002). Researchers have suggested that attachment security (or low levels of attachment anxiety and avoidance) is critical for adaptive functioning in HE (Lopez, 2009). Attachment insecurity, however, is believed to be associated with a wide variety of maladaptive behaviours and mental health concerns. Specifically, the negative internalised working models associated with attachment insecurity interfere with the optimal development of mental stability, adaptive coping behaviours, and affect regulation (Bowlby, 1988; Malik, Wells, & Wittkowsi, 2015).

Attachment theory can be argued as a framework for understanding mental health that is particularly relevant to students due to the emerging adult life stage they are at and the separation from family of origin inherent of commencing university life. While a very large proportion of social-cognitive adult attachment research utilises student samples (an issue highlighted by Malik et al., 2015 and a systematic review by Gillath et al., 2009), this is often through convenience rather than a direct focus on the context of higher education. However, this should not detract from the utility of attachment theory for student mental health as recent research has highlighted the benefits of the activation of a secure attachment figure as a functional method for coping with the transition to higher education (Poeiro, Totterdell, Emerson, & Miles, 2015). Poeiro and colleagues (2015) reported that daydreaming about a significant other reduced loneliness and increased positive affect amongst university students.

## 1.5.2. Mindfulness and University Students

There is a growing literature detailing the effects of introducing and cultivating mindfulness through varying methods to university students (e.g. Dvořáková et al., 2017; Rogers, 2003; Schure, Chrostopher, & Christopher, 2008). Given the increasing demands on students, rise in stress, and mental health issues, mindfulness and mindfulness practice have, unsurprisingly, garnered attention as a method to promote student well-being.

Recently, mindfulness-based interventions have been widely applied in research and integrated into undergraduate student programmes as a method to equip students with effective coping strategies for those who find themselves under considerable stress (see Bamber & Schneider, 2016 for review). Overall, these studies indicated that mindfulness meditation is a promising avenue to explore in reducing stress and anxiety in undergraduate students. Research has also found that stress fully mediated the relationship between mindfulness and alcohol-related problems (including binge drinking and sustaining injuries due to alcohol consumption) amongst students (Bodenlos, Noonan, & Wells, 2013), highlighting the potential of utilising mindfulness-based programmes to combat maladaptive behaviours concerning alcohol consumption on university campuses via stress reduction.

Mindfulness-based Coping with University Life is an 8-week meditation-based program designed to introduce students to the concept and practice of mindfulness (Lynch, Gender, Kohls, Kudielka, & Walach, 2010). In a wait-list-controlled evaluation of this programme, Lynch and colleagues (2010) reported the salutary effects of the programme with participants in the mindfulness condition exhibiting significant reductions in perceived stress and anxiety as well as significant increases in dispositional mindfulness. This presents the possibility of mindfulness-based programmes as an effective, and promising, tool for undergraduate students to cope with university life and promoting mental well-being. Not only are mindfulness-based programmes easy to implement and relatively inexpensive, the increasing mental health awareness and popularity of mindfulness could prove successful in cultivating student interest.

## 1.5.3. Best Practice for Promoting Optimal Psychological Functioning and Well-being

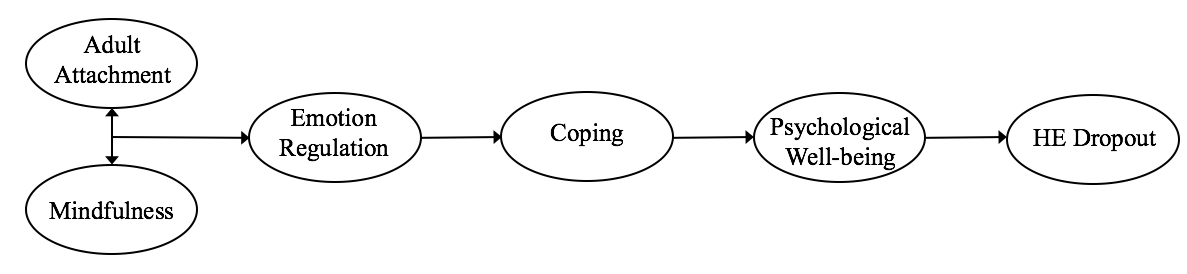
As discussed in previous sections, both attachment security and mindfulness have been repeatedly linked to adaptive psychological functioning. Documented throughout the literature, bolstering attachment security and engaging in mindfulness practice have desirable outcomes when implemented independently. It is interesting to note that there is no body of work examining the benefits and pitfalls, comparing, or even combining these methods to develop effective resources to promote optimal psychological well-being and mental health.

Whilst popular theory (e.g., Brown et al., 2007) postulates about the possibilities of bidirectionality between adult attachment and mindfulness, no research has examined the causal relationship between the two. Understanding the nature of the relationship between attachment orientation and mindfulness could prove to be invaluable when developing resources aimed at promoting mental health and well-being, including amongst student populations. Addressing the fundamental question of how these two constructs are related, examining the directionality of their relationship, and establishing the mechanisms that underlie their associations could inform the possibility of a dual-pronged approach to resource materials (activating attachment security and mindfulness practice) as being most effective rather than a single method approach.

**1.5.4. Proposed Theoretical Model of Factors Influencing Psychological Well-being Amongst University Students**

To clearly illustrate the interrelations between pertinent constructs highlighted throughout this chapter, I propose a general theoretical model. A total of four variables were identified for inclusion in the proposed model (Figure 1.1) of factors influencing psychological well-being and, subsequently, intent to drop out of university. These variables are adult attachment, mindfulness, emotion regulation, and coping behaviours. The model is based on both empirical data and theory, as reviewed above.

The resulting model suggests that two primary, endogenous latent variables (adult attachment and mindfulness) play an indirect, but pivotal role in the promotion of psychological well-being and consequent intent to drop out. Reflecting the popular theory of bidirectionality between adult attachment and mindfulness, as well as their similarities, their distinct relationship is hypothesised to influence emotion regulation. In turn, emotion regulation directly influences the way in which individuals approach and cope with stressors and stressful experiences. These efforts to cope, and effectives of diminishing immediate threats or stressors, are hypothesised to influence psychological well-being which, in a student population, is hypothesised to directly influence intentions to persist in HE.

*Figure 1.1*: Proposed theoretical model of interrelations between adult attachment, mindfulness, and psychological well-being outcomes.

As the main goal of this doctoral thesis is theory-building through delineating the relationship between adult attachment and mindfulness, it should be noted that the empirical research included in this work is not intended as a complete test of the proposed model. Rather, I test various relationships that are directly suggested or implied by the model. Specifically, in Chapter 3, the associations between adult attachment, mindfulness, and emotion regulation are examined through factor analysis, the results of which will be applied to tackle the pathway between them and psychological well-being and drop out intention via the construct of coping. Chapter 4 will examine the pathways between adult attachment and mindfulness and each of the remaining variables, over time, by assessing the predictive value of both adult attachment and mindfulness. Additionally, Chapter 4 will seek to further delineate the relationship between adult attachment and mindfulness, tackling this isolated pathway to examine the directionality of their association. Finally, Chapter 5 aims to tackle the direct pathway between adult attachment and mindfulness at the state level, to determine the causality in their relationship

# Chapter 2. The Relationship Between Adult Attachment Orientation and Mindfulness: A Systematic Review and Meta-analysis

**Abstract**

Mindfulness can be measured as an individual trait, which varies between individuals. In recent years, research has investigated the overlap between trait mindfulness and attachment. The aim of the present review and meta-analysis was to investigate the current evidence linking adult attachment dimensions to trait mindfulness dimensions, and to quantitatively synthesise these findings using meta-analyses. A systematic literature search was conducted using five scientific databases of which yielded 33 articles meeting the inclusion criteria. Inclusion criteria were: publication in peer-reviewed journals or dissertations published in English, that relied on quantitative methods using reliable and validated self-report measures of attachment orientation and mindfulness, where study participants were aged 16 years and older. Random-effects model meta-analytic procedures were used to investigate the relationship between both constructs. Cross-sectional studies found significant negative correlations between adult attachment insecurity, on either dimension (anxiety or avoidance) and both total mindfulness score and all 5 sub-dimensions of mindfulness (act with awareness, observe, describe, non-reacting, and non-judging), with the exception of a non-significant positive correlation between attachment anxiety and observe. The effect size of the relationships ranged from small to medium. The overall mean effect sizes were moderate (anxiety; *r*+ = -.36, avoidance; *r*+ = -.28), with both attachment dimensions associated with lower levels of total mindfulness. Results are discussed in relation to theory and research. Implications for future research include the need to utilise longitudinal design to address causality and mechanisms of the relationship between these constructs.

**2.1. Introduction**

The main purpose of this doctoral thesis was to elucidate the relationship between the constructs of adult attachment and mindfulness and how they influence and impact psychological well-being. The current chapter focuses on the first component of this overall aim, by investigating the available literature linking attachment orientation and dispositional mindfulness and quantitatively synthesise their findings, employing meta-analysis.

Mindfulness is defined as the self-regulation of attention and the non-evaluative acceptance of one’s immediate experiences (Kabat-Zinn, 1994); it can also provide a greater sense of compassion and kindness for oneself and others (Neff, 2012). Mindfulness is a distinctive state of consciousness compared to that of typical cognitive processing as the individual allows sensory input, noticing it rather than comparing, evaluating, or ruminating about it (Brown et al., 2007). The term mindfulness has been used to describe (i) a psychological trait (dispositional or trait mindfulness), which varies between individuals (Brown & Ryan, 2003); (ii) a particular state of awareness (Germer, Siegel, & Fulton, 2005); and (iii) a contemplative practice (such as mindfulness meditation and mindfulness stress reduction techniques). Contemplative mindfulness practices allow the individual to access a particular state of awareness at the time of practicing. Dispositional mindfulness reflects an individual’s natural inclination towards a mindful way of being, and will likely influence their ability to engage in mindfulness practices and achieve a mindful state. In the development of questionnaire measures of dispositional mindfulness, as outlined in Chapter 1, Baer and colleagues (Baer et al., 2004, 2006, 2008) reported five facets: acting with awareness (attending fully to one’s activity, without “autopilot”), observing (noticing internal and external stimuli), describing (labelling one’s experiences), non-judging (refraining from evaluating one’s experiences), and non-reacting (experiencing one’s thoughts and feelings without needing to immediately respond).

A large body of research has demonstrated that as a contemplative practice, mindfulness has benefits on mental, emotional, and physical health, and can lead to increases in dispositional mindfulness (Greeson, 2009; Keng, Smoski, & Robins, 2011; Brown & Ryan, 2003; Baer, 2015). In addition, dispositional mindfulness is associated with positive psychological outcomes including stress reduction, lower emotional reactivity, as well as increased well-being (Farb et al., 2010; Ortner, Kilner, & Zelazo, 2007; Carmody & Baer, 2008). These positive effects are likely because mindfulness enables individuals to disengage from their automatic thoughts and behaviour patterns and, in turn, fosters informed and conscious regulation as a means to promote positive functioning (Ryan & Deci, 2000). Given the rapidly growing body of research on mindfulness, it is important that we are able to delineate the correlates and antecedents of mindfulness, for example, which individual difference factors might be related to, and indeed predictive of, dispositional mindfulness. In considering the antecedents of mindfulness, researchers have posited that, along with aspects of adaptive functioning, it is helpful to place mindfulness within a social context. Furthermore, researchers have proposed that the attachment theory provides the most appropriate conceptual framework with which to do so (Shaver et al., 2007).

Attachment theory (Bowlby, 1969) postulates that adult attachment style, a trait-like pattern of affect regulation strategies, develops as a reflection of the sum total of experiences of being cared for in close relationships. As a result of these caregiving experiences, individuals develop an internal working model (Bowlby, 1969, 1973) of the self, others, and relationships, that guide the manner in which we experience and deal with stress or threat (Bowlby, 1982; Waters et al., 2002). Internal working models are essentially pathways of cognitive structures that reflect the cumulative perceptions of personal experiences with past attachment figures (Collins, Guichard, Ford, & Feeney, 2004). Research has highlighted the influence that these working models have on information processing and interpersonal functioning, which include attitudes, emotions, affect regulation, and behavioural strategies (see Mikulincer & Shaver, 2007; Shaver & Mikulincer, 2002 for a review). More broadly, they influence the way we attend to and perceive information, from both internal and external sources. As discussed in Chapter 1 (section 1.2.1.), two research traditions exist in adult attachment. The developmental tradition tends to focus on the role of maternal relationships in early life, and how these affect intergenerational (parenting) relationships with children, and mental health (Schore, 2001). This research tradition often employs interview and narrative techniques to assess state of mind with respect to attachment (Shaver & Mikulincer, 2002). The social, cognitive, and personality tradition tends to focus more on adult pair bond relationships, and hierarchies of attachment styles with a variety of current attachment figures (e.g., Collins & Read, 1994). This research tradition often employs self-report measures of attachment style, in relation to romantic partners or close others generally, and the impact they have on a wide variety of outcomes associated with well-being and functioning (see Mikulincer & Shaver 2007, for a review).

Current conceptualisations of attachment style focus on two dimensions of attachment insecurity: anxiety about abandonment and avoidance of intimacy (Brennan et al., 1998). As previously outlined in Chapter 1 (section 1.2.1.), the organisation of the attachment system is said to reflect the quality and responsiveness of early caregiving experiences which can result in a hyper- or deactivation of the attachment system. Those high in attachment anxiety engage in hyperactivation of the attachment system characterised by an intense need for proximity seeking and protection and hypersensitivity towards signs of rejection (Mikulincer & Florian, 1998). Conversely, those high in attachment avoidance engage in deactivation of the attachment system characterised by an avoidance of proximity seeking and a denial of attachment needs (Mikulincer & Shaver, 2003).

There are several points of contact between mindfulness and attachment security which were first identified by Ryan et al. (2007), and subsequently expanded upon by Shaver et al. (2007). Firstly, both constructs share similar positive effects on a range of outcomes related to well-being. Secure adult attachment and mindfulness have been linked to the same positive outcomes regarding one’s mental and physical health, along with more successful relationships, adaptive coping when faced with threatening stimuli, higher self-esteem, and increased self-regulation (Ryan et al., 2007; Shaver et al., 2007). Moreover, neurological studies have reported similar neural pathways for secure attachment, emotional self-regulation, and mindfulness (Gillath, Bunge, Shaver, Wendelken, & Mikulincer, 2005; Shaver et al., 2007; Siegel, 2007). While much remains to be explored in regards to the neural correlates of attachment and mindfulness, the existing literature suggests that those neural structures governing executive functioning, emotional regulation, and attention are indeed associated with the constructs of attachment and mindfulness (Siegel, 2007).

Secondly, there are parallels that can be drawn between secure attachment relationship experiences and Buddhist forms of mindfulness meditation in terms of accessing mental representations of security and bolstering mindfulness, and conversely, between insecure representations and hampered mindfulness efforts. Buddhist practice can involve accessing representations of acceptance by a loving Buddha, their teachings, and a community of fellow Buddhists, which is conceptually similar to attachment theory’s notions of secure base and safe haven provided by security-enhancing attachment figures (Shaver et al., 2007). Furthermore, when considering attachment insecurity, it is easy to see how incompatible both avoidance and anxiety are with effective mindfulness practice. While mindfulness represents an open and accepting outlook with direct observations and a removed or decentred approach to thoughts and feelings, attachment anxiety leads to feelings of unworthiness, hypervigilance along with a hypersensitivity to rejection, and also increased levels of rumination (Mikulincer & Florian, 1998). Conversely, attachment avoidance is characterised by emotion and thought suppression, a discomfort with close relationships, and avoidance regarding thoughts and feelings, more often towards those negative in nature (Mikulincer & Shaver, 2003). Shaver et al., (2007) likened attachment anxiety to the “grasping” at or obsessing over, and attachment avoidance to the repression of, unwanted thoughts in meditative practice (Chödrön, 2003). Attachment security, however, should enable an individual to approach their thought processes in a more balanced and forgiving way.

Thirdly, there may be a bidirectional relationship such that security-enhancing relationship experiences are likely to increase a person’s capacity for mindfulness and conversely, mindfulness meditation is likely to increase a person’s capacity for secure relationships. In light of the similarities between attachment security and mindfulness, and incompatibility between attachment insecurity and mindfulness, researchers have theorised about the relationship between these two variables. It is possible that an individual’s secure attachment may cultivate compassion for the suffering of others (Mikulincer, Shaver, Gillath, & Nitzberg, 2005). Such compassion is also regarded as a product of mindfulness (Brach, 2003; Neff, 2003). Ryan et al. (2007) emphasised three potential connections between secure attachment and mindfulness and the bidirectional nature of this relationship: (i) it is possible that they develop simultaneously in response to a caring, responsive, and comforting caregiver experience throughout childhood; (ii) they may both be related to attentive and securely attached relationship styles; and (iii) secure attachment and mindfulness may both be related to the development of adequate qualities and mechanisms to deal with stress.

Some researchers have attempted to assess directionality in this relationship. Ma (2008) reported that mindfulness partially mediated the association between increased attachment security and overall adaptive functioning, and that changes in mindfulness during therapy partially mediated the link between changes in attachment security and changes in adaptive functioning. However, analyses presenting attachment security as the mediator between mindfulness and adaptive functioning were not presented, so it is not possible to be confident that attachment security is a precursor for mindfulness in these data, rather than the other way around. Further research speaks to the issue of directionality in the relationship between attachment and mindfulness. Rowe, Shepstone, Carnelley, Cavanagh, and Millings (2016) primed mindfulness naïve participants with attachment security, self-compassion, or a neutral control, prior to them undertaking a taster session in mindfulness. Participants who received either the security prime, or the self-compassion prime, were more willing to engage in further mindfulness training. It is possible that these primes, including attachment security, made it easier for participants to successfully achieve a mindful state. But whether the practice of mindfulness could also enable participants to more successfully visualise attachment security is yet to be examined. Researchers have also investigated whether training in mindfulness could offset or ameliorate the negative impacts of attachment insecurity on relationships with others, such as children (Snyder, Shapiro, & Treleaven, 2012). Further research is needed to examine this potential effect the other way around, i.e., whether activating a sense of attachment security could ameliorate the impact of having low trait mindfulness.

The potential for bidirectionality in the relationship between attachment security and mindfulness comes from the core qualities of mindfulness fostering a secure attachment, as well as a secure attachment fostering the development of mindfulness. Those individuals who exhibit a secure attachment style are likely to develop self-trust and also be trusting of others, to be easily placated and comforted when stressed, have a repertoire of effective coping strategies, and to be compassionate (Ryan et al., 2007). It is these qualities that are thought to allow individuals to pay attention, to be present to both positive and negative experiences, and to do so nonjudgmentally, which are all key components of mindfulness.

While the directionality and mechanisms of the relationship between attachment and mindfulness are not yet well defined, there seems little doubt that these two constructs are very likely to be linked. Indeed, in the 12 years since researchers began to theoretically examine the nature of the relationship between attachment security and mindfulness (Shaver et al., 2007; Ryan et al., 2007), a bourgeoning body of literature has examined this relationship empirically. However, to the best of my knowledge, no systematic review of this literature has been conducted. It is therefore timely and useful to conduct a systematic review and statistical synthesis of the nature of the relationship between mindfulness and attachment. While much of the available literature tackles the question of “are they related?” more effectively than the question of “how are they related?”, it is hoped that the present review will serve as a springboard for future research to begin to tackle the important issue of mechanisms. Therefore, the current review seeks to (i) identify publications documenting the relationship between attachment style and mindfulness; (ii) synthesise the findings using meta-analysis; and (iii) critique the methodologies employed in order to make recommendations for future research.

**2.2. Method**

## 2.2.1. Search Strategy

A systematic search of the online databases PsycArticles, PsycInfo, PubMed, and Psychology and Behavioural Sciences Collection was conducted to find published articles. Unpublished works were searched using ProQuest. All searches were conducted between November 2015 and February 2016, using the combination of terms “attachment” and “mindfulness.” Forward and backward citation searching completed the search.

## 2.2.2. Inclusion and Exclusion Criteria

Studies were included if they met the following criteria: (i) published/written in English. (ii) used a quantitative methodology, (iii) used psychometrically reliable and validated self-report measures of adult attachment and dispositional mindfulness, (iv) participants were aged 16 and over. For inclusion in the meta-analysis, studies were required to report the statistical association between attachment and dispositional mindfulness at one given time point (i.e., cross-sectional design or baseline data). Single case designs were excluded. All authors contributed to the decision-making process for inclusion of articles; articles were only included if all authors were in agreement.

## 2.2.3. Data Extraction

The following data were extracted from each study: country, year of publication, publication outlet, design, sample characteristics (gender, age, and, where available, meditation experience), design characteristics (sample population, measures used, experimental condition used, when applicable). Data pertaining to the statistical significance and effect size were also extracted from each study. The main aim of the meta-analysis was to assess the strength of the relationship between adult attachment dimensions and mindfulness (including subscales); therefore, statistics that detailed the nature of the relationship were extracted, which included r values (for use in the meta-analyses).

## 2.2.4. Statistical Analysis

Twelve separate meta-analyses were performed, on data from 16 studies, to assess associations between adult attachment and dispositional mindfulness. The analyses evaluated the relationship between (1) attachment anxiety and total mindfulness and (2) attachment avoidance and total mindfulness. Further analyses (*n* = 10) were conducted on a subset of studies (*n* = ranged from 8 to 12) to assess the relationships between the two attachment dimensions (anxiety and avoidance) and five facets of mindfulness: acting with awareness, observing, describing, non-judging, and non-reacting subscales (Baer et al., 2006). All studies included in this analysis utilised the Five Facet Mindfulness Questionnaire (FFMQ; Baer et al., 2006), which includes each of the facets of mindfulness within five subscales, or the Kentucky Inventory of Mindfulness Skills (KIMS; Baer et al., 2004), which includes four of the five facets of mindfulness (excluding non-reactivity from those listed above). The remaining analyses therefore examined the relationships between (3) attachment anxiety and act with awareness; (4) attachment anxiety and observing; (5) attachment anxiety and describing; (6) attachment anxiety and non-judging; (7) attachment anxiety and non-reacting; (8) attachment avoidance and act with awareness; (9) attachment avoidance and observing; (10) attachment avoidance and describing; (11) attachment avoidance and non-judging; and (12) attachment avoidance and non-reacting. The meta-analyses were conducted using STATA (version 12) and were based on random-effects models. Such models assume that the effect size of the relationship between the attachment and mindfulness variables in each of the studies varies as a function of differences in study characteristics as well as sampling error. The weighted average effect sizes were computed using the STATA command *metan* (Harris et al., 2008), which implements the random-effects model specified by DerSimonian and Laird (1986). Effect sizes were computed using Pearson’s r (r+). Standard errors, used to weight each effect size, were calculated according to the specifications of Lipsey and Wilson (2001). Effect sizes were interpreted using standard convention (Cohen, 1992), in which values of .1, .3, and .5 represent small, medium, and large effect sizes, respectively.

## 2.2.5. Moderator Analyses

Heterogeneity was evaluated using Cochran’s homogeneity Q statistic and *I2* statistic. In the event that the *Q* statistic is significant, this indicates that the relationship between the specified attachment and mindfulness variables across the relevant set of studies could be due to factors other than sampling error. The *I2* statistic is an estimate of the percentage of variability in the effect size estimate that can be attributed to these factors, as opposed to the sampling error. As a general guideline, an *I2* statistic of 30 to 60% indicates moderate variability, with over 75% indicating considerable variability (Higgins, Green, & Leeson, 2009).

In order to assess whether certain characteristics of the included population samples moderated the relationship between adult attachment dimensions (anxiety and avoidance) and mindfulness, moderator analyses were conducted using a metaregression approach (Thompson & Sharp, 1999). This method can be used to determine the effect of both continuous and categorical moderators in order to assess whether each moderator was associated with significant variance in the effect size for each reported relationship (the beta and *p* values in meta regression indicate the strength and significance of this association, respectively). These analyses were performed using the STATA command *metareg* (Hardboard & Higgins, 2008). Moderators were coded across studies in order to characterise differences in study samples. These moderators focused on demographic characteristics of the included samples, more specifically the possible effects of mean age and the percentage of female participants.

## 2.2.6. Quality Assessment

An assessment of the quality of included studies informed the critique of the literature and highlighted areas for future directions, rather than determining inclusion in the review. Papers were rated by the first author using an adapted form of the Effective Public Health Practice Project (EPHPP) Tool. The EPHPP has been shown to have good construct validity (Thomas, Ciliska, Dobbins, & Micucci, 2003) and inter-rater reliability (Armijo-Olivo, Stiles, Hagen, Biondo, & Cummings, 2012). All studies were assessed on four relevant criteria taken from the EPHPP: (a) Selection bias, (b) Blinding, (c) Data collection methods, and (d) Withdrawals and dropout (attrition). Each domain is given an overall rating of “strong,” “moderate,” or “weak.” A global rating is then allocated on the following basis: strong (no weak ratings), moderate (one weak rating), or weak (two or more weak ratings).

**2.3. Results**

Initial searches yielded 10,239 papers published between 1919 and 2016. Seventy-one studies were duplicates. Therefore, 10,168 titles and abstracts were screened using the inclusion criteria. Thirty-nine full text articles were accessed, of which 31 fulfilled criteria for inclusion. Several articles reported multiple studies; only studies reporting on the relationship between adult attachment and mindfulness were extracted from these papers. A total of 33 studies were included in the review (see Fig. 2.1 for PRISMA diagram).

## 2.3.1. Overview of Studies

Table 2.1 provides an overview of all studies. The studies were conducted across a number of countries: USA (*n* = 22), Australia (*n* = 6), UK (*n* = 3), Canada (*n* = 1), and Italy (*n* = 1). Sample size ranged from 39 to 1702, with a large portion of studies (*n* = 25) including over 100 participants. The majority of studies used undergraduate student (*n* = 20) samples, three of which used a mix of undergraduate students and the general population. One study used high school students over the age of 16.

Five studies specifically recruited couples, including couples from the general population (*n* = 1), newlyweds within their first year of marriage (*n* = 1), heterosexual married couples (*n* = 1), undergraduate student couples (*n* = 1), and couples in a relationship lasting longer than 6 months (*n* = 1). Two studies recruited participants who were in or had recently been in a romantic relationship including individuals in a committed relationship greater than 1 year (*n* = 1), students who had experienced the dissolution of a romantic relationship in the last 24 months (*n* = 1). Three studies investigated populations that had sought out or were currently seeking psychological intervention (counselling and eating pathology treatment).

*Figure 2.1:* PRISMA flow diagram of systematic search.

Identification

Records identified through database searches

(*n* = 10,239)

Records excluded

(*n* = 8)

Records excluded

(*n* = 10,129)

Included

Screening

Eligibility

Studies included in review

(*n* = 33)

Full-text articles assessed for eligibility

(*n* = 39)

Records meeting eligibility

(*n* = 31)

Articles included in review

(*n* = 31; with two articles incorporating multiple studies)

Records screened

(*n* = 10,168)

Records after duplicates removed

(*n* = 10,168)

The majority of studies measured adult attachment using the Experiences in Close Relationships-Revised scale (ECR-R; Fraley et al., 2000; *n* = 22). The ECR-R measure has been used extensively in attachment research and is a revised version of the original scale, which provides attachment scores along two dimensions (attachment anxiety and avoidance). Other measures included the Experiences in Close Relationships scale (Brennan et al., 1998; *n* = 10), the State Adult Attachment Measure (SAAM; Gillath et al., 2009; *n* = 1), the Attachment Style Questionnaire (ASQ; Feeney et al., 1994; *n* = 1), the Relationship Questionnaire (RQ; Bartholomew and Horowitz, 1991; *n* = 1), and the Inventory of Parent and Peer Attachment (IPPA; Armsden & Greenberg, 1989; *n* = 1).

The most commonly used measures of mindfulness were the Mindful Attention Awareness Scale (MAAS; Brown and Ryan, 2003; *n* = 14) and the FFMQ (Baer et al., 2006; *n* = 14). Both measures provide a total score, representing overall trait mindfulness; the FFMQ also provides scores for five subscales (Act with awareness, Observe, Describe, Non-judging, and Non-reacting). Other measures included the Freiburg Mindfulness Inventory (FMI; Walach et al., 2006; *n* = 4), the KIMS (Baer et al., 2004; *n* = 2), the Toronto Mindfulness Scale (TMS; Lau et al., 2006; *n* = 2), the Child and Adolescent Mindfulness Measure (CAMM; Greco, Baer, & Smith, 2011; *n* = 1), and the Cognitive and Affective Mindfulness Scale-Revised (CAMS-R; Feldman et al., 2007; *n* = 1). It should be noted that several studies used multiple measures of adult attachment and mindfulness. For the relationships between attachment dimensions and both total mindfulness and the subscales, I first present the meta-analysis findings followed by some observations from a narrative review.

Table 2.1 – *Studies exploring the association between adult attachment and mindfulness.*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Authors, year, and country | Participant sample | Procedure | Measure of attachment | Measure of mindfulness | Results | Quality rating |
| Caldwell and Shaver (2013); USA | 93 undergraduate students | Completed measures at one time point | Experiences in Close Relationships Scale (ECR) | Mindful Attention Awareness Scale (MAAS) | Attachment anxiety and avoidance significantly negatively correlated with mindfulness. | Moderate |
| Caldwell and Shaver (2015); USA | 39 women who suffered childhood maltreatment | Mindfulness intervention, completed measures at multiple time points | Experiences in Close Relationship Scale (ECR) | Five Facet Mindfulness Questionnaire (FFMQ) | Attachment and avoidance significantly negatively correlated with total mindfulness. | Strong |
| Ciano (2013); USAa | 102 adults from the general population | Completed measures at one time point | Experiences in Close Relationships Scale – Revised (ECR-R) | Mindful Attention Awareness Scale (MAAS) | Attachment anxiety and avoidance significant predictor of the non-judge subscale. | Strong |

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| --- | --- | --- | --- | --- | --- | --- |
| Cordon and Finney (2008); USAa | 495 undergraduate students | Completed measures at one time point | Experiences in Close Relationships Scale – Revised (ECR-R) | Mindful Attention Awareness Scale (MAAS) | Attachment security associated with greater mindfulness. | Moderate |
| Edwards (2014); USA | 81 newlywed couples in 1st year of marriage | Completed measures at one time point | Experiences in Close Relationships Scale – Revised (ECR-R) | Mindful Attention Awareness Scale (MAAS) | For both husbands and wives, significant negative correlation between attachment anxiety and mindfulness. | Moderate |
| Falb (2015); USAa | 87 undergraduate students | Completed measures at three time points | Experiences in Close Relationships Scale – Revised (ECR-R) | Five Facet Mindfulness Questionnaire (FFMQ) | Secure attachment predicted mindfulness. Level of attachment predicted 4/5 mindfulness subscales (describing; act with awareness; non-judge; non-react). | Weak |

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| --- | --- | --- | --- | --- | --- | --- |
| Fossati et al., (2011); ITAa | 501 high school students (16 years +) | Completed measures at one time point | Attachment Style Questionnaire (ASQ) | Mindful Attention Awareness Scale (MAAS) | Low mindfulness scores associated with aspects of avoidant and anxious attachment. | Strong |

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Table 2.1 – *continued.*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Authors, year, and country | Participant sample | Procedure | Measure of attachment | Measure of mindfulness | Results | Quality rating |
| Goodall, Trejnowska, and Darling (2012); UK | 199 adults from the general population | Completed measures at one time point | Experiences in Close Relationships Scale – Revised (ECR-R) | Five Facet Mindfulness Questionnaire (FFMQ) | Attachment anxiety significantly negatively correlated with subscales describe, act with awareness, non-judge, and non-react. Attachment avoidance significantly negatively correlated with subscales describe, act with awareness, and non-judge. | Moderate |
| Hertz, Laurent, and Laurent (2015); USAa | 103 undergraduate student couples | Completed measures at one time point | Experiences in Close Relationships Scale (ECR) | Five Facet Mindfulness Questionnaire (FFMQ) | Attachment anxiety and avoidance significantly negatively correlated with mindfulness. Mindfulness score significant in predicting attachment anxiety and avoidance. | Strong |
| Kubota (2015); USA | 112 undergraduate students | Completed measures at one time point | Relationship Questionnaire (RQ)  Experiences in Close Relationships Scale – Revised (ECR-R) | Five Facet Mindfulness Questionnaire (FFMQ)  Mindful Attention Awareness Scale (MAAS) | Attachment anxiety significantly correlated with total mindfulness score and 4/5 subscales (describe; act with awareness; non-judge; non-react).  Attachment avoidance significantly correlated with total mindfulness score and 3/5 subscales (describe; act with awareness; non-judge). | Moderate |
| Leigh (2010); USA | 200 undergraduate students | Completed measures at one time point | Experiences in Close Relationships Scale (ECR) | Freiburg Mindfulness Inventory (FMI)  Five Facet Mindfulness Questionnaire (FFMQ) | Attachment anxiety significantly negatively correlated with total mindfulness score and 3/5 subscales (act with awareness; non-judge; non-react). Attachment avoidance negatively correlated with total mindfulness score and 4/5 subscales (describe; act with awareness; non-judge; non-react). Attachment anxiety significantly predicted lower mindfulness and act with awareness, non-react, and non-judge subscales. Attachment avoidance significantly predicted lower mindfulness and describe subscale. | Moderate |

Table 2.1 – *continued.*

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|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Authors, year, and country | Participant sample | Procedure | Measure of attachment | Measure of mindfulness | Results | Quality rating |
| Ma (2008); USAa | 90 undergraduate students seeking therapy within past 6 months | Completed measures pre and post (multiple time points) therapy | Experiences in Close Relationships Scale (ECR) | Five Facet Mindfulness Questionnaire (FFMQ) | Attachment security significantly correlated with mindfulness. | Moderate |
| Macaulay et al. (2015); CAN | 505 undergraduate students | Completed measures at one time point | Experiences in Close Relationships Scale – Revised (ECR-R) | Kentucky Inventory of Mindfulness Sills (KIMS) | Attachment anxiety significantly negatively correlated with 2/4 KIMS subscales (act with awareness; accept). Attachment avoidance significantly negatively correlated with describe subscale only. | Weak |
| Maniaci (2015); USA | 175 heterosexual married couples | Completed measures at 4 time points (data extracted only from first) | Experiences in Close Relationships Scale – Revised (ECR-R) | Five Facet Mindfulness Questionnaire (FFMQ) | In husbands, attachment anxiety and avoidance significantly negatively correlated with mindfulness. In wives, only attachment anxiety significantly negatively correlated with mindfulness. | Moderate |
| Martin (2012); USAa | Two samples – 28 recruited from counselling services, 81 undergraduate students | Daily assessment battery of measures | Experiences in Close Relationships Scale (ECR)  State Adult Attachment Measure (SAAM) | Five Facet Mindfulness Questionnaire (FFMQ)  Cognitive and Affective Mindfulness Scale –  Revised (CAMS-R) | Findings suggest increased mindfulness reduce attachment anxiety and help to reduce attachment avoidance tendencies. | Moderate |
| Ormiston (2012); USA | 300 individuals in relationship (t least 6 months in length) | Completed measures at one time point | Experiences in Close Relationships Scale – Revised (ECR-R)  Relationship Questionnaire (RQ) | Mindful Attention Awareness Scale (MAAS) | Attachment anxiety and avoidance significantly negatively correlated with mindfulness. | Moderate |

Table 2.1 – *continued.*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Authors, year, and country | Participant sample | Procedure | Measure of attachment | Measure of mindfulness | Results | Quality rating |
| Palmer (2014); USA | 120 individuals from the local community | Completed measure pre and post positive recall intervention | Experiences in Close Relationships Scale (ECR) | Mindful Attention Awareness Scale (MAAS) | Attachment anxiety significantly positively correlated with mindfulness. | Strong |
| Pepping, Davis, and O’Donovan (2013); AUS | 572 undergraduate students | Completed measures at one time point | Experiences in Close Relationships Scale – Revised (ECR-R) | Five Facet Mindfulness Questionnaire (FFMQ) | Attachment anxiety and avoidance significantly negatively correlated with mindfulness. | Moderate |
| Pepping and Duvenage (2015); AUSa  *Study 1* | 128 undergraduate students | Completed measures at one time point | Experiences in Close Relationships Scale – Revised (ECR-R) | Child and Adolescent Mindfulness Measure (CAMM) | Attachment anxiety and avoidance associated with lower mindfulness. | Moderate |
| Pepping, O’Donovan, and Davis (2014); AUSa | 290 undergraduate students | Completed measures at one time point | Experiences in Close Relationships Scale – Revised (ECR-R) | Five Facet Mindfulness Questionnaire (FFMQ) | Attachment anxiety and avoidance significantly negatively correlated with total mindfulness. Significant differences between meditators and non-meditators. Across both samples (meditators and non-meditators) attachment anxiety and avoidance significantly associated with all 5 mindfulness subscales. | Moderate |
| Pepping et al. (2015); AUS  *Study 1*  *Study 2* | 144 undergraduate students  55 women seeking eating pathology treatment | Completed measures at one time point  Completes measures at one time point | Experiences in Close Relationships Scale – Revised (ECR-R)  Experiences in Close Relationships Scale – Revised (ECR-R) | Five Facet Mindfulness Questionnaire (FFMQ)  Five Facet Mindfulness Questionnaire (FFMQ) | Attachment anxiety and avoidance significantly negatively correlated with mindfulness.  Attachment anxiety and avoidance significantly negatively correlated with mindfulness. | Moderate  Moderate |

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Table 2.1 – *continued.*

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| --- | --- | --- | --- | --- | --- | --- |
| Authors, year, and country | Participant sample | Procedure | Measure of attachment | Measure of mindfulness | Results | Quality rating |
| Pidgeon and Giufre (2014); AUSa | 156 undergraduate students | Completed measures at one time point | Experiences in Close Relationships Scale-Revised (ECR-R) | Freiburg Mindfulness Inventory (FMI) | Attachment anxiety and avoidance significantly negatively correlated with mindfulness. | Moderate |
| Rowe et al. (2016); UK | 117 participants;  undergraduate students and non-students | Completed measures at varying time points, self-compassion and attachment security priming | Experiences in Close Relationships Scale (ECR) | Freiburg Mindfulness Inventory (FMI)  Toronto Mindfulness Scale (TMS) | Attachment anxiety and avoidance (measured one day post-experimental condition) not significantly correlated with trait or state mindfulness. | Moderate |
| Saavedra (2011); USA  *Study 1*  *Study 2* | 1501 general population currently in romantic relationship  187 couples – two subsamples 89 couples from previous study and 98 additional couples | Completed measures at multiple time points  Completed measures at multiple time points | Experiences in Close Relationships Scale-Revised (ECR-R)  Experiences in Close Relationships Scale-Revised (ECR-R) | Mindful Attention Awareness Scale (MAAS)  Mindful Attention Awareness Scale (MAAS) | In both female and males, attachment anxiety and avoidance significantly negatively correlated with mindfulness (labelled as act with awareness)  In both females and males, attachment anxiety and avoidance significantly negatively correlated with total mindfulness. Attachment anxiety significantly negatively correlated with subscales non-judge and non-react. Attachment avoidance significantly negatively correlated with subscales describe and non-judge. | Moderate  Moderate |
| Saavedra, Chapman, and Rogge (2010); USA | 1702 individuals in a romantic relationship | Completed measures at one time point | Experiences in Close Relationships Scale – Revised (ECR-R) | Mindful Attention Awareness Scale (MAAS) | Attachment anxiety and avoidance significantly negatively correlated with mindfulness. | Moderate |
| Sahdra et al. (2011); USA | 60 individuals from general population recruited through meditation magazine | Completed measures before and after mindfulness intervention | Experiences in Close Relationship Scale (ECR) | Five Facet Mindfulness Questionnaire (FFMQ) | Attachment anxiety significantly negatively correlated with total mindfulness and subscales act with awareness, non-judge, and non-react. Attachment avoidance significantly negatively correlated with total mindfulness and all 5 subscales. | Strong |
|  |  |  |  |  |  |  |

Table 2.1 – *continued.*

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|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Authors, year, and country | Participant sample | Procedure | Measure of attachment | Measure of mindfulness | Results | Quality rating |
| Somohano (2013); USAa | 97 undergraduate students in relationship cohabiting with partner | Completed measures at one time point | Experiences in Close Relationships Scale – Revised (ECR-R) | Freiburg Mindfulness Inventory (FMI) | Significant difference in mindfulness scores between attachment groups. Clinical significance between secure and anxious attachment. | Moderate |
| Tomac (2011); USAa | 114 individuals from university participant pool | Completed measures at one time point | Experiences in Close Relationships Scale – Revised (ECR-R) | Mindful Attention Awareness Scale (MAAS) | Attachment security significantly negatively correlated with total mindfulness. Attachment anxiety and avoidance related to lower mindfulness scores. | Moderate |
| Walsh et al. (2009); UK  *Study 1* | 127 undergraduates and university staff | Completed measures at one time point | Experiences in Close Relationships Scale – Revised (ECR-R) | Mindful Attention Awareness Scale (MAAS) | Attachment anxiety and avoidance significantly negatively correlated with mindfulness. | Weak |
| Wang (2012); USA | 282 undergraduate students | Completed measures at one time point | Experiences in Close Relationships Scale – Revised (ECR-R)  The Inventory of Parent and Peer Attachment (IPPA) | Mindful Attention Awareness Scale (MAAS)  Toronto Mindfulness Scale (TMS) | Attachment anxiety and avoidance significantly negatively correlated with mindfulness. | Weak |
| Wilson (2012); USA | Undergraduate students  1st phase – 315  2nd phase -232 | Completed measures pre and post trauma writing intervention | Experiences in Close Relationships Scale (ECR) | Kentucky Inventory of Mindfulness Sills (KIMS) | Attachment anxiety significantly negatively correlated with total KIMS mindfulness, describe, act with awareness, and accept significantly positively correlated with observe subscale. Attachment avoidance significantly negatively correlated with total KIMS mindfulness, describe, act with awareness, and accept. | Moderate |

a Denotes studies *not* in the meta-analyses

## 2.3.2. Relationship Between Attachment Dimensions and Total Mindfulness

Table 2.2 presents the results from each of the meta-analyses conducted. The relationships between the two attachment dimensions (anxiety and avoidance) and dispositional mindfulness both yielded small-to-medium effect sizes.

The overall sample-weighted relationship between attachment anxiety and mindfulness was *r*+ = −.36 (95% CI [−.40, −.32]), based on 22 participant samples taken from 19 articles and 5964 participants. There was significant variation in the observed relationship across studies (*Q*[22] = 60.92, *p* < .001), with a moderate-to-high level of heterogeneity across studies (*I2* = 65.5%). The majority of coefficients reported in the studies were significant and negative, ranging −.22 to −.63 (Palmer, 2014; Pepping et al., 2013, respectively). The overall sample-weighted relationship between attachment avoidance and mindfulness was *r*+ = −.28 (95% CI [−.33, −.23]), based on 21 participant samples taken from 18 articles, and 5844 participants. There was significant variation in the observed relationship across studies (*Q*[21] = 73.21, p < .001), with a high level of heterogeneity across studies (*I2* = 72.7%). The majority of coefficients reported in studies were significant and negative, ranging from −.21 to −.54 (Pepping et al., 2013; Wilson, 2012).

Contradictory to the above findings, Rowe et al., (2016) was the only study that did not find any significant correlations between attachment and mindfulness (attachment anxiety-mindfulness, *r* = .12, −.10; attachment avoidance-mindfulness, *r* = −.14, −.20).

Table 2.2 **-** *Sample-weighted average effect size of the relationship between adult attachment and mindfulness variables.*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Relationship measured | *r+* | *k* | *n* | 95% CI | *X*2 | *I*2 |
| Adult attachment anxiety |  | | | | | |
| Total Mindfulness | -0.36\*\*\* | 22 | 5964 | -0.40, -0.32 | 60.92\*\*\* | 65.5% |
| Act with awareness | -0.33\*\*\* | 12 | 5637 | -0.38, -0.29 | 26.27\*\* | 58.1% |
| Observe | 0.01 | 10 | 2279 | -0.07, 0.10 | 37.95\*\*\* | 76.3% |
| Describe | -0.17\*\*\* | 10 | 2279 | -0.26, -0.08 | 42.86\*\*\* | 79% |
| Non-judging | -0.45\*\*\* | 10 | 2279 | -0.51, -0.40 | 19.20\*\* | 53.1% |
| Non-reacting | -0.26\*\*\* | 8 | 1542 | -0.35, -0.16 | 25.90\*\* | 73% |
| Adult attachment avoidance |  |  |  |  |  |  |
| Total Mindfulness | -0.28\*\*\* | 21 | 5844 | -0.33, -0.23 | 73.21\*\*\* | 72.7% |
| Act with awareness | -0.26\*\*\* | 12 | 5637 | -0.31, -0.20 | 42.60\*\*\* | 74.2% |
| Observe | -0.09\* | 10 | 2279 | -0.17, -0.02 | 28.03\*\* | 67.9% |
| Describe | -0.29\*\*\* | 10 | 2279 | -0.37, -0.20 | 36.65\*\*\* | 75.4% |
| Non-judging | -0.28\*\*\* | 10 | 2279 | -0.32, -0.21 | 22.92\*\* | 60.7% |
| Non-reacting | -0.16\*\* | 8 | 1542 | -0.27, -0.05 | 33.83\*\*\* | 79.3% |

*Note.* CI = confidence interval

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

## 2.3.3. Subscale Analysis

Subscale analysis examining the relationship between each of the two attachment dimensions (anxiety and avoidance) and the subscales of mindfulness (as measured by FFMQ and KIMS) produced nine (from a possible ten) significant, negative effect sizes (*p* < .05), of which three were small (anxiety-describe; avoidance-observe; avoidance-non-reacting); five were medium (anxiety-act with awareness; anxiety-non-reacting; avoidance-act with awareness; avoidance-describe; avoidance-non-judging); and one was large (anxiety-non-judging). Thus, higher levels of attachment insecurity (avoidance or anxiety) were associated with lower levels of dispositional mindfulness on almost every dimension (bar attachment anxiety and observe, see Table 2.2).

The largest effect size was between attachment anxiety and non-judging, reflecting that the strongest significant correlations were consistently reported between attachment anxiety and non-judging (range *r* = −.33 to −.61; both reported in Pepping et al., 2014). The relationships between attachment dimensions and the observe subscale were the weakest, with the effect size for avoidance-observe being the smallest significant effect, and the effect size for anxiety-observe being non-significant. Across the studies, the observe subscale of mindfulness was widely reported as being negatively and non-significantly associated with both dimensions of adult attachment in all but three studies (Pepping et al., 2014; Sahdra et al., 2011; Wilson, 2012). These studies reported significant positive associations between the observe subscale and attachment anxiety (range *r* = .14 to .15) and significant negative associations between the observe subscale and attachment avoidance (range *r* = −.27 to −.30).

## 2.3.4. Moderators of the Relationship Between Adult Attachment and Mindfulness

Two population sample characteristics were evaluated as moderators of the relationship between adult attachment dimensions (anxiety and avoidance) and total mindfulness (see Table 2.3).

The metaregression confirmed that the mean age of participants did not moderate the observed effect size of the relationship between attachment anxiety and total mindfulness (*β* = −.00, *p* = .91) or attachment avoidance and total mindfulness (*β* = −.00, *p* = .76). Likewise, the gender of participants did not moderate the observed effect sizes (attachment anxiety and mindfulness, *β* = −.00, *p* = .58; attachment avoidance and mindfulness, *β* = −.00, *p* = .40). It can therefore be concluded that age and gender had no impact on effect sizes and that the variance in the measured relationships occurs irrespective of these sample characteristics.

## 2.3.5. Methodological Critique

Overall quality ratings from the EPHPP assessment are provided in Table 2.1; domain specific ratings are reported in Table 2.4. A large majority (23 out of 33) of the reviewed studies were rated as moderate, while only six were rated as strong. A major weakness across studies was selection bias. Almost all of the studies failed to include a representative sample, with the majority sampling a student population (*n* = 22), which limits the generalisability of the findings to a wider population.

There were also inherent limitations in the design of the studies reviewed. By virtue of the aims of this review, and the inclusion criteria, all of the studies relied on a cross-sectional design, which saw participants completing self-report measures of attachment and mindfulness at one time-point. While an appropriate way in which to capture data on the relationship between two variables, this study design does not allow for inferences about causality or confirm stability of any identified relationship over time. Furthermore, while the measures included were reliable and validated, it should not be ignored that the self-report nature of these measures could lead to potential response bias. The majority of studies used the ECR-R to measure adult attachment, which is multidimensional, measuring individual differences in attachment anxiety and attachment avoidance, whereas some studies used a state measure of adult attachment (studies examining state mindfulness were not included in the meta-analyses). It can be argued that the ECR-R, while a validated and reliable measure, is considered to measure adult attachment as a trait, similar to a personality trait. Studies using different measures of attachment and mindfulness reported similar associations, despite the lack of consistency in measurement.

Table 2.3 – *Moderators of the relationships between adult attachment dimensions and mindfulness*.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Relationship | Moderator | Regression coefficient | Standard error | *k* | *n* | 95% CI | *I2* | Adj *R2* |
| Attachment anxiety  and total mindfulness | Mean age | -0.00 | 0.00 | 21 | 5837 | -0.01, 0.01 | 68.61% | -6.74% |
|  | Percentage female | -0.00 | 0.00 | 18 | 4940 | -0.00, 0.00 | 68.92% | -4.20% |
| Attachment avoidance  and total mindfulness | Mean age | -0.00 | 0.00 | 20 | 5717 | -0.01, 0.01 | 75.33% | -7.22% |
|  | Percentage female | -0.00 | 0.00 | 17 | 4820 | -0.00, 0.00 | 56.02% | 1.19% |

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Columns *k* and *n* represent number of studies and number of participants, respectively. Additionally, studies that failed to report mean age or that reported male and female participant data separately were excluded from these analyses.

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

Table 2.4 – *Quality ratings (weak, moderate, and strong) for the adapted EPHPP and overall quality rating.*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Study reference | Selection bias | Blinding | Measures | Attrition | Overall |
| Caldwell and Shaver (2013) | M | M | S | N/A | M |
| Caldwell & Shaver (2015) | S | M | S | S | S |
| Ciano (2013) | S | W | S | N/A | S |
| Cordon & Finney (2008) | W | M | S | N/A | M |
| Edwards (2014) | M | W | S | N/A | M |
| Falb (2015) | W | W | S | W | W |
| Fossati et al. (2011) | S | W | S | N/A | S |
| Goodall, Trejnowska, and Darling (2012) | M | W | S | N/A | M |
| Hertz, Laurent, and Laurent (2015) | S | W | S | S | S |
| Kubota (2015) | M | W | S | N/A | M |
| Leigh (2010) | M | W | S | N/A | M |
| Ma (2009) | M | W | S | N/A | M |
| Macaulay et al. (2015) | W | W | S | N/A | W |
| Maniaci (2015) | M | M | M | W | M |
| Martin (2012) | M | W | S | M | M |
| Ormiston (2012) | M | W | S | N/A | M |
| Palmer (2014) | M | S | S | S | S |
| Pepping, Davis, and O’Donovan (2015)  *Study 1*  *Study 2* | W  M | M  M | S  S | N/A  N/A | M  M |
| Pepping and Duvenage (2015)  *Study 1* | W | M | S | N/A | M |
| Pepping and O’Donovan (2013) | W | M | S | N/A | M |
| Pepping, O’Donovan, and Davis (2013) | W | M | S | N/A | M |

Strong = 3+ strong ratings. Moderate = 2+ moderate/strong, < 2weak ratings. Weak = 2+ weak ratings.

Table 2.4 –*continued.*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Study reference | Selection bias | Blinding | Measures | Attrition | Overall |
| Pidgeon and Giufre (2014) | W | M | S | N/A | M |
| Rowe et al. (2016) | M | M | S | W | M |
| Saavedra (2011)  *Study 1*  *Study 2* | M  M | M  M | S  S | W  W | M  M |
| Saavedra, Chapman, and Rogge (2010) | M | M | S | N/A | M |
| Sahdra et al. (2011) | S | M | S | S | S |
| Somohana (2013) | M | W | S | N/A | M |
| Tomac (2011) | M | M | S | N/A | M |
| Walsch et al., (2008) | W | W | S | N/A | W |
| Wang (2012) | W | S | W | N/A | W |
| Wilson (2012) | W | M | S | N/A | M |
| Total for each dimensions  Weak  Moderate  Strong | 11  17  5 | 14  17  2 | 1  1  31 | 5  1  4 | 4  23  6 |

Strong = 3+ strong ratings. Moderate = 2+ moderate/strong, < 2weak ratings. Weak = 2+ weak ratings.

**2.4. Discussion**

The current review presents the first systematic synthesis, meta-analysis, and critical appraisal of existing research that has set out to examine the association between adult attachment dimensions and mindfulness. Here I discuss the key findings in relation to theory, methodological issues relating to the literature reviewed, limitations, and implications for future research.

Using meta-analysis, I found a clear significant relationship between the two constructs, with anxiety and avoidance attachment dimensions being associated with, and in some cases, statistically predictive of, levels of total mindfulness. A large majority of the cross-sectional studies included in the review reported significant negative correlations between attachment anxiety and mindfulness. However, Edwards (2014), Maniaci (2015), and Rowe et al. (2016) failed to find significant associations between attachment avoidance and total mindfulness scores. Interestingly, both Edwards (2014) and Maniaci (2015) reported non-significant correlations for the females taking part in the study, while only Edwards (2014) reported non-significant correlations for both male and female participant mindfulness scores and attachment avoidance. Rowe et al. (2016) did not report significant associations between attachment anxiety and state and trait mindfulness. However, this appears to be an anomalous result when compared with the majority of the studies included in the review. The remaining cross-sectional studies reported significant correlations between adult attachment avoidance and mindfulness scores for both males and females (where applicable).

Interestingly, attachment anxiety was more often negatively associated with total mindfulness than attachment avoidance; this was also reflected by the results of the meta-analyses. In line with attachment theory (Mikulincer & Shaver, 2007), it appears as though individuals higher in attachment anxiety exhibit a hyperactivation of the attachment system which may, in turn, hinder the optimal fostering of underpinning constructs of mindfulness (such as acting with awareness, non-judging, and also non-reacting). Hypervigilance to threat might also explain the occasional positive association between attachment anxiety and the observe subscale of mindfulness (Ryan et al., 2007). Hypervigilant individuals may be inclined to notice threat cues more readily, which predisposes them to observe and attend to the situations they experience significantly more so than individuals with higher levels of attachment avoidance (Ryan et al., 2007). Meanwhile, those individuals high in attachment avoidance exhibit discomfort with closeness and dependency and so tend to minimise this discomfort by way of deactivation of the attachment system and decreased observation to threats. However, there are important caveats regarding the observe subscale, which mean that caution is needed to not over-interpret any findings pertaining to it (especially in relation to attachment anxiety, where the meta-analysis found no significant relationship with it).

Baer et al. (2006) reported that while observing was a central tendency of mindfulness, the subscale failed to fit their proposed Confirmatory Factor Analysis model, which could be attributed to the differential correlations between observe and the other four facets. They proposed that the emphasis the observe subscale places on external stimuli does not adequately capture the quality of noticing/attending to experience (Baer et al., 2006). Additionally, they reported a significant negative correlation between the observe and non-judge subscales. It would appear that meditation practice and experience has an impact on the individual facets of mindfulness among individuals. It was suggested that in individuals with no meditation experience attending to experiences may be associated with judging them but, through meditation experience higher levels of observing and non-judging should be expected. Pepping et al. (2014) reported differences among the mindfulness subscales between meditators and non-meditators. More specifically, among non-meditators, attachment anxiety and avoidance were positively correlated with observing, whereas for meditators this relationship was negative. There appears to be contention regarding the efficacy of the observe subscale of mindfulness, as it may tap different things depending on the sample, for example when comparing experienced vs. non-experienced meditators and clinical vs. nonclinical participants (Grossman & Van Dam, 2011). Future research should aim to examine the relationship between attachment and the observe facet of mindfulness with an improved measurement tool.

Overall, attachment anxiety was significantly negatively correlated with total mindfulness, as well as four of the five subscales of mindfulness (act with awareness, describe, non-judging, and non-reacting). The strongest association was between attachment anxiety and the non-judging subscale across the three most commonly used mindfulness measures; the non-judging subscale of the FFMQ, the accept without judgmentsubscale of the KIMS, and the non-judging subscale of the MAAS (reported in Macaulay, Watt, MacLean, & Weaver, 2015; Pepping et al., 2014; Saavedra, 2011).

The meta-analyses and synthesis highlight the significant negative relationships between attachment avoidance, total mindfulness, and each of the five mindfulness subscales. The describe and non-reacting subscale of the FFMQ and the describe subscale of the KIMS reported the strongest correlations with attachment avoidance (reported in Pepping et al., 2014; Macaulay et al., 2015). The deactivation of the attachment system exhibited by individuals high in attachment avoidance (Mikulincer & Shaver, 2007) can explain these relationships. Those high in avoidance tend to cut off from their emotions (Wei et al., 2005). Although this might suggest that avoidant individuals would therefore be better able to be non-reacting, ironically, their emotional cut off then leads them to experience greater negative mood (Wei et al., 2005). Furthermore, while avoidant individuals are typically good at suppressing unwanted thoughts (Mikulincer, Dolev, & Shaver, 2004), these strategies are known to fail under cognitive load (Mikulincer et al., 2004, Mikulincer, Birnbaum, Woddis, & Nachmias, 2000), potentially undermining any facilitating effects on non-reacting they may have had.

While a majority of these studies reported the associations between attachment dimensions and total mindfulness, they still tell us little about the mechanisms of this association. However, Pepping et al. (2013) attempted to further understand this and reported that difficulties in emotion regulation fully mediated the relationship between adult attachment variables and mindfulness. However, this analysis was not conducted in the opposite direction, meaning that we cannot infer that attachment style leads to emotion regulation, which leads to mindfulness, rather than the other way around. Further research is needed to address directionality.

As reported above, the key limitations of the available literature linking adult attachment and mindfulness is firstly the reliance on cross-sectional data collection, and secondly the paucity of representative samples. While cross-sectional studies are invaluable for taking a first look at the nature of a relationship between two constructs (as was the focus of the present review), future research needs to move beyond this towards longitudinal data collection over time, in order to address the issues of development and causality. Based on the current state of the literature, it remains unclear whether increased levels of adult attachment anxiety and avoidance lead to increased mindfulness or vice versa. Several studies used regression analyses to further investigate the reported relationship. For example, Caldwell & Shaver (2013), found that attachment anxiety and avoidance were significant predictors of higher levels of total mindfulness, although they did not assess this over time, and others have begun to explore mechanisms (Macaulay et al., 2015). Nevertheless, further research is needed to expand on these findings and to fully explore the nature in which adult attachment and mindfulness are related and how they influence one another.

There is no universal measure of either adult attachment or mindfulness, which has led to a degree of measurement heterogeneity across studies. This means that there is no reason to believe that the findings presented in the included studies were a result of specific measures used. Equally, because similar findings emerged from studies of varying quality (ranging from weak to strong on the EPHPP), it is likely that the findings are not attributable to study quality. These two things combined give confidence in the overall findings as they appear to be independent of both the measures used and the study quality.

Furthermore, all studies included in the meta-analysis employed self-report measures of the constructs. Although the majority of the measures used are reliable and validated, a problem of the reliance on self-report methodology is that correlations between measures may be artificially inflated by shared method variance. Future research would benefit from including measures based on diagnostic interviews to further control for possible self-report biases.

**2.5. Limitations and Future Directions**

While offering the first meta-analysis of the relationship between adult attachment style and mindfulness, the current review is not without limitations. Only articles published in the English language were included and while measures of adult attachment and mindfulness have been translated into other languages, it was not practical to include the research that employs them in the present review. This may have led to an under-representation of certain cultures, potentially leading to generalisability issues.

The results of the metaregression indicated that neither mean age nor gender of participants were significant moderators of the effect size of the relationship between both adult attachment dimensions and total mindfulness scores. Therefore, these sample characteristics cannot account for the reported variance in the examined relationships. While the present study focused on these two key characteristics of the included sample populations and found there to be no significant effects, additional moderator analyses would be desirable. However, the studies reviewed proved too heterogeneous for further moderator analyses to be an option at present. That is to say, the variability of sample characteristics is too great to establish additional key variables to treat as potential moderators, and, crucially, to have a sufficient number of studies featuring each key variable. In future, as the literature grows it would be sensible to examine variables such as meditation experience, design characteristics, nationality of population sample, as well as the specific self-report measures used as potential moderators of the relationship between attachment style and mindfulness.

It is still largely unknown how mindfulness develops, whether it is a direct result of specific attachment styles or whether the core qualities of mindfulness influence the development of a secure attachment and overall adaptive functioning and to what extent. The current review is also limited by the quality of the studies reviewed, and their reliance on cross-sectional designs. Future research should seek to examine the development of attachment styles and mindfulness over time, as well as the extent to which one construct predicts another, and the mechanisms of these effects. Longitudinal design employing measurement of potential mediators would be a fruitful addition to current research. In conducting this review, I particularly noticed the paucity of research examining experimental manipulations or interventions targeting one construct, and measuring the outcomes on the other construct. In addition to longitudinal design, such work would go a long way to addressing causality and mechanisms, without the sometimes prohibitive overheads of long-term longitudinal designs.

Additionally, the majority of studies examined here focused on the dispositional nature of both adult attachment and mindfulness. To further understand the relationship between and development of both constructs research may benefit from a shift to focusing on the state/contextual nature of both adult attachment and mindfulness. More specifically, to avoid further self-report biases, research may wish to employ more observational research methods. While there are observational methods available to measure adult attachment (e.g., the Adult Attachment Interview; George et al., 1985), no observational method exists to successfully assess mindfulness. Future research may wish to explore the development of an observational mindfulness assessment although this may prove difficult due to the inherently intrinsic qualities of the construct.

It is hoped that the present review and meta-analysis will serve as a spring broad for further research to address issues of causality and interaction between attachment and mindfulness. When the literature matures to include more prospective and experimental designs, a further review would be timely. It might be that targeting both constructs in interventions could lead to even greater benefit than targeting one or the other, in which case the development and implementation of mindfulness and attachment-based interventions to enhance positive functioning and well-being could be improved.

The findings detailed in this systematic review and meta-analysis beg the question of whether the relationship between attachment orientation and mindfulness has implications for psychological well-being. Goodall and colleagues (2015) proposed that adult attachment orientation and mindfulness may also be independently related to emotion regulation. To further explore this issue, and the potential implications for well-being, Chapter 3 details the collection of primary data on adult attachment, mindfulness, emotion regulation, coping, and psychological well-being outcomes, in an undergraduate population.

# Chapter 3. Psychological Well-being and Coping: The Predictive Value of Adult Attachment, Dispositional Mindfulness, and Emotion Regulation

**Abstract**

The primary aim of this study was to examine the underlying relationship between adult attachment, dispositional mindfulness, and emotion regulation, and investigate how well these constructs can predict coping and well-being. A sample of university student participants (*n* = 174) completed an online survey to assess attachment orientation (anxiety, avoidance, disorganisation), emotion regulation, dispositional mindfulness, coping behaviours, psychological well-being, and intent to drop out of university. Exploratory factor analysis assessed the underlying relationship between measures of attachment orientation, emotion regulation, and mindfulness, and presented a two-factor solution accounting for 47% of total variance across participant scores. Attachment orientation, mindfulness, and emotion regulation subscales differentially loaded across the two factors. The first factor, “resilient mental functioning,” accounted for 33% of variance; the second factor, “disorganised emotional functioning,” accounted for 14% of total variance. These two extracted factors were used in subsequent mediation modelling to determine the effects of coping behaviours on the relationship between the extracted factors and six subscales of psychological well-being. Mediation analyses revealed that defeatism coping was a significant mediator in the relationship between resilient mental functioning and five of the psychological well-being scales and between disorganised emotional functioning and all six of these scales. The results add to the current understanding of the relationship between all three constructs and are the first to examine the construct of adult disorganised attachment and its possible role in the relationship between adult attachment orientation and dispositional mindfulness, as well as its influence on emotion regulation.

# 3.1. Introduction

In the previous chapter, I examined the relationship between attachment orientation and trait mindfulness via meta-analysis and clear significant relationships between these two constructs were established. Both dimensions of adult attachment, anxiety and avoidance, are associated with levels of total mindfulness, with attachment security (low anxiety and avoidance) associated with greater dispositional mindfulness. In some cases, adult attachment orientation was statistically predictive of total mindfulness.

In the present chapter, I move forward to apply these two constructs to coping, psychological well-being, and intent to drop out of university in a student sample. Here, I expand our definition of attachment orientation to include not only anxiety and avoidance, but also disorganisation. A relatively new development in self-report measurement of attachment orientation, disorganisation encapsulates fear in relationships. This was included in the present chapter due to the limited literature available exploring this construct and its nomological network. Including it in the present chapter will not only deepen our understanding of disorganisation in adulthood, but also its relationship with dispositional mindfulness and its influence on psychological well-being.

## 3.1.1. Mindfulness and Emotion Regulation

While attention and awareness are relatively constant features of normal functioning, mindfulness can be considered a state of enhanced attention to, and awareness of, current experiences (Brown & Ryan 2003). This awareness is said to emerge through sustained attention, in the present moment, and non-judgmentally (Kabat-Zinn, 2003). Mindfulness is understood to be both a state, usually accessed during mindfulness meditations, and a dispositional trait (Brown et al., 2007). Shapiro, Brown, Thoresen, and Plante (2011) reported the long-term benefits of mindfulness-based interventions with a significant increase in trait mindfulness up to 1 year later. While dispositional mindfulness can be increased through mindfulness-based training (Baer et al., 2008; Falkenström, 2010), research has also highlighted individual differences amongst those with no prior meditation experience (Brown et al. 2007; Cordon & Finney, 2008; Walach et al., 2006). As a dispositional trait, mindfulness is believed to cultivate understanding and insight regarding the present moment, alongside a greater compassion for oneself and others (Brach, 2003). Increasing dispositional mindfulness through specific training has been shown to lead to improvements in mental and emotional health functioning (Hofmann, Sawyer, Witt, & Oh, 2010; Paul, Stanton, Greeson, Smoski, & Wang, 2013). Ryan and Deci (2000) posited that mindfulness serves as an important mechanism in allowing individuals to disengage from automatic thoughts and unhealthy behaviour patterns, while simultaneously promoting informed and self-endorsed behaviour regulation, which is associated with the enhancement of well-being.

A number of definitions of mindfulness have been put forward, which are relevant to describing this dispositional trait. Bishop et al. (2004) proposed a two-component definition of mindfulness: the first component focusing on the self-regulation of attention (including sustained attention and non-elaborative awareness of thoughts, feelings, and sensations) while the second focuses on the ability to approach experiences with an orientation of acceptance (detailed in Chapter 1, section 1.3.2.1.1.). As previously outlined in Chapter 1 (section 1.3.2.1.2.) Baer et al. (2004, 2006, 2008) reported five emerging facets of the mindfulness construct (represented by five subscales): acting with awareness (attending fully to one’s activities, not going into autopilot), observing (noticing internal and external stimuli), describing (the ability to label one’s experiences), non-judging (refraining from immediately evaluating one’s experiences), and non-reacting (the ability to experience thoughts and feelings without the need to immediately respond).

Common to these conceptualisations of mindfulness is a component that refers to acceptance or non-judging. Previous research has proposed that the attitude of acceptance cultivated through mindfulness reduces tendencies of aversion and attachment to internal and external experiences, which in turn facilitates the process of emotion regulation (Hayes & Feldman, 2004; Kumar, Feldman, & Hayes, 2008). There is a degree of overlap in the conceptual definitions of both of these constructs regarding the awareness and acceptance of emotions/emotional responses. Drawing distinct parallels to dispositional mindfulness, Gratz and Roemer (2004) defined emotion regulation as the ability to monitor, accept, and understand emotions and to continue with goal-directed behaviour when emotionally activated. Emotion regulation is traditionally viewed as encompassing two alternative strategies: expressive suppression and cognitive reappraisal (Gross, 1998). Expressive suppression attempts to limit, or exaggerate, the representation of emotion itself (Kim & Hamann, 2007), whereas cognitive reappraisal seeks to alter the context in which the emotion-inducing stimulus is viewed and, in doing so, altering the emotional response (Ochsner, Bunge, Gross, & Gabrieli, 2002). While clear parallels can be drawn between emotion regulation and mindfulness, they can also be distinguished by their approach to emotional experience. Whereas emotion regulation strategies seek to alter the emotional experience, mindfulness attempts to create psychological distance between the emotion in question and the individual by limiting the behavioural reactions (Kabat-Zinn, Lipworth, & Burney, 1985). For example, the combined awareness and acceptance of the elements of mindfulness encourage the individual to observe emotions without reacting. In this way, mindfulness training is thought to increase metacognitive awareness, the ability to experience thoughts and feelings from a distanced and decentred perspective. Through this perspective, thoughts and emotions are considered “mental events” rather than accurate reflections of reality (Teasdale et al., 1995; Teasdale, et al., 2002). Furthermore, mindfulness training has shown to significantly improve emotion regulation (Goldin & Gross, 2010; Jermann et al., 2009; Modinos, Ormel, & Aleman, 2010).

## 3.1.2. Attachment Orientation and Emotion Regulation

The individual differences in the capacity to alter, obstruct, or suppress the generation, activation, and expression of emotions using cognitive affect and behavioural techniques has long been postulated by attachment theorists to lie in the development of attachment orientations (Mikulincer, Shaver, & Pereg, 2003). Attachment security (individuals exhibiting low levels of attachment anxiety and avoidance) is purported to facilitate security-based strategies of emotion regulation aimed to reduce distress, maintain intimate relationships, and increase personal adjustment through “constructive, flexible, and reality-attuned coping efforts” (Shaver & Mikulincer, 2007, p. 450). With repeated positive experiences, individuals internalise these emotion regulation strategies and develop confidence in the helpfulness of others. More specifically, effective adaptation in the context of secure attachment can be attributed to emotion regulation capacities, including turning to others for support when threats exceed the individual’s capacity to cope alone (Cloitre, Stovall-McClough, Zorbas, & Charuvastra, 2008).

Differences in adult attachment are generally conceptualised along two dimensions of attachment insecurity that are believed to underlie the universal patterns of thoughts, behaviours, and feelings that occur within the context of relationships. Such dimensions have been labelled attachment anxiety and avoidance (Brennan & Shaver, 1995). These attachment dimensions are further characterised by the unique way in which they represent the organisation of the attachment system. Attachment anxiety describes the tendency by which individuals worry about social rejection and the availability of support from others, thought to have developed as a result of the inconsistency of caregivers (Bowlby, 1969, 1973). Individuals exhibiting higher attachment anxiety possess a heightened sensitivity towards signals of acceptance as well as rejection (Shaver & Mikulincer, 2002). Attachment avoidance develops due to a lack of availability and sensitivity of caregivers. Therefore, these individuals have learned to expect neither availability nor sensitivity from others and, as a result, become insensitive to such signals (Shaver & Mikulincer, 2002).

Research has identified an additional dimension of childhood attachment—disorganised attachment, which is present in infants who do not demonstrate an organised secure, anxious, or avoidant strategy to deal with distress (Main & Solomon, 1990). Attachment disorganisation in infancy is purported to be predictive of maladaptive behaviours in childhood, adolescence, and early adulthood (Hesse & Main, 2000). The disorganised category has also been successfully applied to adult attachment orientations (Hesse & Main, 2000). In adult attachment dimensions, “fear” is used to refer to a fear of abandonment (attachment anxiety) and a fear of intimacy (attachment avoidance), both are believed to be normal components of organised attachment strategies (Paetzold et al., 2015). Paetzold and colleagues (2015) proposed that, in the context of romantic attachment, the central characteristic of disorganised attachment in adulthood is a general fear of romantic attachment figures. The fear associated with disorganised attachment is embedded in the individual’s internal working model and is generalised across attachment figures, as well as remaining stable over time (Paetzold et al., 2015).

Within the context of adult attachment, fear in more anxious individuals encourages approaching behaviours and in more avoidant individuals encourages distancing behaviours as a means to protect against abandonment and rejection (Paetzold et al., 2015). However, individuals exhibiting disorganised attachment patterns face a unique situation as their fear of their attachment figure results in confused and contradictory behaviour. On the one hand, they attempt to seek to approach the attachment figure as a source of comfort but, as their attachment figure is also their main source of fear, these approaches remain incomplete and appear chaotic (Paetzold et al., 2015). In children, this disorganisation has been linked to dissociation and externalising behavioural problems such as aggression (Hesse & Main, 2000; Ogawa, Sroufe, Weinfield, Carlson, & Egeland, 1997). If these behavioural issues remain constant into adulthood, they would negatively impact an individual’s mental health functioning and, ultimately, their psychological well-being (Paetzold et al., 2015).

While there is still uncertainty as to how mindfulness and attachment orientation are related, a recent meta-analysis reported that attachment anxiety and avoidance were significantly associated with lower overall dispositional mindfulness (Stevenson, Emerson, & Millings, 2017). Secure adult attachment and mindfulness have been linked to the same positive outcomes regarding one’s mental health and functioning (Ryan et al., 2007; Shaver et al., 2007), such as increased emotion regulation capacities (cognitive reappraisal), adaptive coping strategies, lower levels of perceived stress, trait anxiety, depression, and increased mental well-being (Baer et al., 2012; Cordon, Brown, & Gibson, 2009; Walsh et al., 2009; Weinstein, Brown, & Ryan, 2009). Conversely, insecure attachment, low dispositional mindfulness, and the implementation of, and reliance on, expressive suppression are associated with increased levels of depression, anxiety, maladaptive coping strategies, and decreased levels of mental well-being (Gross & John 2003; Kashdan, Barrios, Forsyth, & Steger, 2006; Shaver et al., 2007; Sperberg & Stabb, 1998). According to Folkman, Lazarus, Gruen, and DeLongis (1986), in an effort to confront stressful situations, individuals rely on a range of cognitive, emotional, and/or behavioural strategies. Research has highlighted the important role these strategies play in our psychological well-being (Mosley Jr et al., 1994; Parsons, Frydenberg, & Poole, 1996). More specifically, insecure adult attachment orientations and lower dispositional mindfulness have all been shown to influence the utilisation of maladaptive coping behaviours (McNally, Palfai, Levine, & Moore, 2003; Palmer & Rodger, 2009). Therefore, it could be argued that maladaptive emotion regulation strategies (such as expressive suppression) are, in themselves, maladaptive emotional coping behaviours.

Goodall et al. (2012) demonstrated the relationship between dispositional mindfulness, emotion regulation difficulties, and adult attachment orientations by using exploratory factor analysis, which illustrated the independent and underlying relationships between all three constructs. The authors analysed cross-sectional data collected using the Five Facet Mindfulness Questionnaire (FFMQ; Baer et al., 2006), Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer 2004), and the Experiences in Close Relationship-Revised scale (ECR-R; Fraley et al., 2000). The resultant two-factor model accounted for 52% of the variance across participant scores on the included measures. The authors labelled the first factor (which accounted for 36% of variance) as meta-cognition of emotional states; this included loadings from mindfulness subscales of acting with awareness, non-judging of experience, and non-reactivity to inner experience, and emotion regulation subscales of non-acceptance of emotional responses, difficulties engaging in goal-directed behaviour, and impulse control difficulties. The second factor was labelled conscious awareness of emotional states (accounted for 16% of variance) with loadings from mindfulness subscales of describing/labelling experiences with words and acting with awareness, DERS subscales of lack of emotional awareness and lack of emotional clarity, and also with attachment anxiety. The authors concluded that attachment security and emotion regulation are both related to mindfulness. The method utilised by Goodall et al. (2012) begins to elucidate how these concepts are linked. Here, I extend this work in 3 key ways. Firstly, the emotion regulation, measure used by Goodall et al. (2012) is limited to considering only difficulties and fails to consider the strategies employed by individuals to regulate their emotions. I use an alternative measure to address this. Secondly, since the Goodall et al. (2012) study, a self-report measure of adult disorganised attachment has been published (Paetzold et al., 2015), which allows for further extension of our understanding of how attachment relates to mindfulness and emotion regulation. However, following Goodall et al. exploratory factor analysis is used to determine the underlying relationships between the constructs. Thirdly, I examined the relationship between not only attachment orientation, mindfulness, and emotion regulation, but also coping, and subsequently use these constructs as predictors of (a) psychological well-being, and (b) intent to drop out of university. The choice of dependent variables here is intended to capture both a broad indicator of psychological health and a proxy for a behavioural outcome indicative of coping (or not) with the pressures of student life.

Given the salience of stress encountered by university students, the ways in which they choose to cope with stress may prove to be a critical factor in determining those students who are at risk and may benefit from interventions to increase resilience and address psychological well-being deficits. Maladaptive coping behaviours have been repeatedly identified as an important mechanism linking perceived stress and the onset of mental ill-health (e.g., Aldao, Nolen-Hoeksema, & Schweizer, 2010; Coiro, Bettis, & Compas, 2017). Recently, the dichotomy of “activity” and “defeatism” coping behaviours has been used to identify those individuals employing maladaptive behaviours to cope with stress (see Mohr et al., 2014). Activity coping is characterised by actively turning to work, getting help or advice from others, or coming up with a strategy to face the stressor directly. Conversely, defeatism coping is characterised by behaviours such as giving up, turning to alcohol or substance use, and refusing to believe that something is actually happening (Mohr et al., 2014). These maladaptive defeatism coping behaviours have been linked to impaired physical health, psychosomatic disturbances, along with mental health and psychological well-being deficits in undergraduate student populations (Mohr et al., 2014).

**The Current Study**

In the current study, a cross-sectional design was employed to examine the relationships between adult attachment, mindfulness, emotion regulation, coping, psychological well-being, and intent to drop out of university.

As attachment insecurity and lower mindfulness have consistently been associated with, and predictive of, maladaptive coping (e.g., Palmer & Rodger, 2009), it was hypothesised that similar associations would be evident in the present sample.

*H1: Greater attachment insecurity (anxiety, avoidance, and disorganisation) and lower mindfulness will be associated with defeatism coping behaviours.*

As maladaptive coping has been associated with psychological distress (Nielsen & Knardahl, 2014), it was predicted that this relationship would be replicated in the mediation model. Furthermore, insecure attachment orientations have been previously associated with maladaptive coping (Mikulincer & Florian, 1998); therefore, it was hypothesised that this relationship would also be observed within the mediation model. Further to these predictions, the mediation model was exploratory based on the factors extracted from the exploratory factor analysis.

*H2: Defeatism coping behaviours will be associated with psychological well-being.*

*H3: Defeatism coping behaviours will significantly mediate the relationship between the resultant factors (IV) of the included variables in the exploratory factor analysis and psychological well-being and intent to drop out of university (DVs).*

# 3.2. Method

## 3.2.1. Participants

Participants were 219 undergraduate students recruited to complete an online questionnaire using Sona Systems subject pool software, as well as from a university-wide email distribution list. Study requirements asked that all individuals be registered as undergraduate students and no age cut-offs were imposed. After incomplete entries were discarded, 174 completed entries were kept for analysis. This represents a completion rate of 79%. Participants ranged in age from 18 to 65 years old (*M* = 21.18, *SD* = 5.77, 81.6% British, 73.6% female). A majority of the students were in their first year of study (52.9%) and a majority were studying psychology (29.3%; see Supplementary Table 3.1 for additional sample demographic characteristics). The program G\*Power (Faul, Erdfelder, Buchner, & Lang, 2009) was used to determine the minimum number of participants required for the effect size to yield an acceptable level of power. The suggested number of participants for bivariate correlation analyses was 138 and 46 for mediation analyses with one IV and one DV with a moderate effect size of 0.3 and a power level of 0.95. Therefore, the present sample of total of 174 was of adequate size given these guidelines.

## 3.2.2. Procedures

This study was approved by the University of Sheffield Ethics Committee (Psychology). Participants were invited to take part in the study and given access to the questionnaire via a link to the web-based survey hosted via Qualtrics, which was live for a period of 6 weeks. Participants were presented with an online information sheet and provided informed consent electronically before being eligible to take part in the study. Participants then completed a questionnaire containing both demographic items and validated self-report scales (as detailed below). Upon completion of the survey, participants were presented with a debrief page and additional information detailing the aims of the study.

## 3.2.3. Measures

### 3.2.3.1. Adult Attachment Orientation

Adult attachment was assessed using two measures, the Experiences in Close Relationships Revised (ECR-R; Fraley et al., 2000) and the Adult Disorganized Attachment Scale (ADA; Paetzold et al., 2015).

The ECR-R is a 36-item self-report measure which assesses adult attachment. The scale is divided into two 18-item subscales that represent the two hypothesised underlying dimensions of the attachment construct: attachment anxiety and avoidance. Participants were instructed to indicate how they generally experience relationships. Respondents used a 7-point Likert-scale ranging from 1 (*Disagree strongly*) to 7 (*Agree strongly*), with higher scores reflecting a higher endorsement of the construct. An example of an item representing anxiety is “I worry a lot about my relationships.” An example of an item representing avoidance is “I don’t feel comfortable opening up to others.” Test-retest reliability has been reported as .93 and .94 for the anxiety subscale and as .95 and .95 for the avoidance subscale (Fraley et al., 2000). Both the anxiety and avoidance subscales of the ECR-R have high internal reliabilities (Cronbach’s α = .93 and .94 respectively; Sibley, Fischer, & Liu, 2005). The Cronbach’s α coefficients for the current sample were .93 for the anxiety dimension and .89 for the avoidance dimension.

The ECR-R has been used extensively among university student samples with Shaver and Fraley (2004) recommending its use in research. As per previous research, a more global attachment style was assessed in the current study by replacing the terms “romantic partner/partner” with “other people/close others” (see Fraley et al., 2000).

The ADA is a 9-item self-report measure used to assess the level of adult disorganised attachment. Participants were asked to rate their agreement with each statement using a 7- point Likert-scale, from 1 (*Strongly disagree*) to 7 (*Strongly agree*). Sample items include “I never know who I am with romantic partners” and “Fear is a common feeling in close relationships.” The ADA has been shown to have high internal consistency (Cronbach’s α = .91). The Cronbach’s α coefficient for the current sample was .89.

### 3.2.3.2. Mindfulness

Dispositional mindfulness was assessed using the Five Facet Mindfulness Questionnaire, short form (FFMQ-SF; Bohlmeijer, Klooster, Fledderus, Veehof, & Baer, 2011). The FFMQ-SF contains a total of 24-items (12 of which were reverse coded) across five subscales: act with awareness (5 items, e.g., “I rush through activities without being really attentive to them”); describing (5 items, e.g., “I’m good at finding words to describe my feelings”); observing (4 items, e.g., “I notice the smell and aromas of things”); non-judging (5 items, e.g. “I tell myself that I shouldn’t be feeling the way I’m feeling”); and non-reacting (5 items, e.g., “I watch my feelings without getting carried away by them”) (Baer et al., 2008). Respondents were asked to rate the extent to which each statement is true for them using a 5-point Likert-scale ranging from 1 (*Never or very rarely true*) to 5 (*Very often or always true*). All items from the act with awareness and non-judging subscales are reversed for scoring. The subscales of the FFMQ have been shown to have good internal consistencies with Cronbach’s α exceeding the defined criterion of .70 (Bohlmeijer et al., 2011). The Cronbach’s α coefficient for the current sample for total mindfulness was .85 and as follows for the mindfulness subscales: act with awareness (.82), describing (.84), observing (.79), non-judging (.80), and non-reacting (.82).

### 3.2.3.3. Emotion Regulation

The Emotion Regulation Questionnaire (ERQ; Gross & John, 2003) was used to assess emotion regulation strategies using two subscales: cognitive reappraisal (6 items, e.g. “When I want to feel less negative emotion, I change the way I’m thinking about the situation”) and expressive suppression (6 items, e.g. “I keep my emotions to myself”). Respondents were asked to rate items using a 7- point Likert-scale ranging from 1 (*Strongly disagree*) to 7 (*Strongly agree*). This measure has been shown to have good internal consistency with Cronbach’s α coefficient values greater than .80 for both subscales (Gratz & Roemer, 2004) with a test retest reliability of .69 for both subscales over 3 months (Gross & John, 2003). The Cronbach’s α coefficients of the reappraisal and suppression dimensions for the current sample were .89 and .66, respectively. Previous studies have shown acceptable internal consistencies that are slightly higher for the reappraisal than for the suppression subscale (Gross & John, 2003).

### 3.2.3.4. Coping Behaviours

Coping was measured using the BriefCOPE (Carver, 1997), a 28-item self-report measure designed to assess 14 dimensions of coping: self-distraction, active coping, denial, substance abuse, using emotional support, use of instrumental support, behavioural disengagement, venting, positive reframing, planning, humour, acceptance, religion, and self-blame. Each dimension of coping is measured using two items. Respondents were asked to rate the extent to which they engage in each of the behaviours using a 4-point Likert-scale ranging from 1 (*I have not been doing this at all*) to 4 (*I have been doing this a lot*). No total scores of coping are given; however, the coping dimensions have previously been combined into two subscales, “activity” and “defeatism” (see Mohr et al., 2014). Subscale scores were calculated for activity coping from 17 items and for defeatism coping from 11 items. Psychometric information was not reported in the original development of this scale. The Cronbach’s α coefficients for the current sample were .85 for the activity subscale and .80 for the defeatism subscale.

### 3.2.3.5. Psychological Well-being

Psychological well-being was measured using an abbreviated version of the Scales of Psychological Well-being (SPWB; Ryff, 1989). This 42-item scale assesses six dimensions of psychological well-being: autonomy (“I tend to worry about what other people think of me”); environmental mastery (“My decisions are not usually influenced by what everyone else is doing”); personal growth (“I am not interested in activities that will expand my horizons”) self-acceptance (“In general, I feel confident and positive about myself”); positive relations with others (“Most people see me as loving and affectionate”); purpose in life (“My daily activities often seem trivial and unimportant to me”); and self-acceptance (“In general, I feel confident and positive about myself”). The original 84-item measure has been shown to have high test-retest reliability (ranging between 0.81 and 0.88 for each of the 6 subscales) and high internal consistency (with Cronbach’s α coefficients from each subscale ranging between .86 and .93; Ryff, 1989). This 42-item measure has been used as a reliable measure of wellbeing with high internal consistencies (Mack et al., 2012). Respondents were asked to rate each item using a 6-point Likert-scale ranging from 1 (*Strongly disagree*) to 6 (*Strongly agree*). In the current sample, the Cronbach’s α coefficients for all of the six dimensions were as follows: autonomy, .79; environmental mastery, .57; personal growth, .81; positive relations; .83; purpose in life, .78; and self-acceptance, .90.

## 3.2.3.6. Intent to Drop Out of University

Intentions to persist in, versus drop out of, university were assessed implementing the same method as Hardre and Reeve (2003). This was created by using the same two items implemented by Vallerand, Fortier, and Guay (1997), which were “I sometimes consider dropping out of school” and “I intend to drop out of school” with the addition of a third “I sometimes feel unsure about continuing my studies year after year” (Hardre & Reeve, 2003). For the purpose of this study “school” was replaced with “university” to establish a focus on higher education within the participant sample. Questions were answered using a 7-point Likert scale ranging from 1 (*Not at all*) to 7 (*Very much*). While the Vallerand et al. (1997) measure was deemed adequately reliable and valid; Hardre and Reeve (2003) assessed the reliability of the addition of the third item. They reported high correlations between the original measure and their adapted three-item measure (*r* = .97, *p* < .01) as well as reporting a Cronbach’s α coefficient of .79. The Cronbach’s α coefficient for the current sample was .81.

## 3.2.4. Statistical Analysis

The alpha level was set to *p* < .05 for all statistical analyses. The assumption of normality was tested for all subscales of adult attachment, mindfulness, and emotion regulation. All variables, with the exception of adult disorganised attachment, were found to be normally distributed, determined by the Kolmogorov-Smirnov test of normality (all *p*’s > .05). The deviation of adult disorganised attachment from normality (*D*(174) = 0.08, *p* = .011) appears to be in line with our theoretical understanding of this construct as attachment disorganisation is thought to coexist alongside attachment anxiety and avoidance and not act as an independent attachment orientation (see Main & Solomon, 1990). This deviation from normality, reported in the current sample, reflects the polarising nature of this maladaptive categorisation and its interaction with high attachment anxiety and avoidance rather than spread across both attachment dimensions. For this reason, this scale was included in further analyses as-is.

SPSS 24.0 was used for the descriptive analysis of raw data, first order correlations between subscales of the FFMQ-SF, ERQ, ECR-R, and ADA, and exploratory factor analysis. In order to explore the relationships between adult attachment, mindfulness, and emotion regulation, the subscales for each measure were entered into an exploratory factor analysis. As the factors were likely to be correlated with one another, oblique rotation was used. Extraction of factors was based on maximum likelihood, and a direct oblimin rotation was used to interpret the factors. Composite scores were then calculated for each of the extracted factors using the regression method. These factor scores were then used as independent variables in mediation analysis using the PROCESS macro (Hayes, 2017).

Mediation examined the relationship between these extracted factors and Ryff’s six scales of psychological well-being (SPWB; Ryff, 1989) via activity and defeatism coping behaviours (BriefCOPE; Carver, 1997). To accomplish this, a bootstrapping approach was used (e.g., Hayes, 2009; Preacher & Hayes, 2004, 2008). Bootstrapping involves creating a repeated series of representations of the population by resampling from the current sample in an attempt to recreate the original sampling procedure. For the present study, the number of bootstrapping samples was set at 5000. These 5000 bootstrapping samples were used to generate the 95% confidence interval for each indirect effect examined. The confidence interval generated using this method is considered statistically significant if it does not contain the value of zero.

The rationale for this statistical analysis strategy was twofold. Firstly, the exploratory factor analysis was used to improve, and extend, the previous work by Goodall and colleagues (2015), exploring the relationship between adult attachment, mindfulness, and emotion regulation. Secondly, given the proposed theoretical model detailed in 1.5.4., the associations between the emerging factors were applied to multiple mediation modelling to examine the associations between variables. Specifically, the mediating role of coping behaviours between the dispositional constructs (adult attachment, mindfulness, and emotion regulation) and psychological well-being and intent to drop out were examined.

# 3.3. Results

Means and standard deviations of variables are reported in Table 3.1.

## 3.3.1. Relationship Between Attachment, Mindfulness, and Emotion Regulation

Bivariate correlations between dimensions of adult attachment (ECR-R; ADA), and subscales of the measures of mindfulness (FFMQ-SF), and emotion regulation (ERQ) are reported in Table 3.1 in detail. There were also moderate negative correlations between total mindfulness scores and attachment dimensions (anxiety, *r* = −.61; avoidance, *r* = −.37; disorganised, *r* = −.30).

Initially, the factorability of the 10 subscales was examined. Firstly, the Kaiser-Meyer-Olkin measure of sampling adequacy was .77, above the recommended value of .70 (Kaiser, 1974). Secondly, the Bartlett’s test of sphericity was significant (χ2 (45) = 379. 95, *p* < .001) and no multicollinearity was detected (correlation matrix determinant = .11). The EFA yielded a two-factor solution and each factor was then interpreted by examining item content and pattern of coefficients. These two factors accounted for a total of 47% of variance.

Factor 1 accounting for 33% of the variance had loadings on act with awareness, non-judging of inner experience, and non-reacting subscales of the FFMQ-SF, as well as the ERQ subscale cognitive reappraisal and loaded negatively onto attachment anxiety from the ECR-R. This factor was labelled “resilient mental functioning.”

Factor 2 accounting for 14% of the variance, loaded negatively on act with awareness and describe of the FFMQ-SF, as well as expressive suppression of the ERQ, attachment avoidance from the ECR-R, and disorganised attachment measured by the ADA. Very high loadings were noted for expressive suppression and attachment avoidance. This factor was labelled “disorganised emotional functioning.”

A third factor exceeded Kaiser’s criterion (accounting for 10% of the variance) and loaded strongly onto the observe subscale (.88) from the FFMQ-SF and less strongly onto disorganised attachment (.33). Considering the caution of Fabrigar, Wegener, MacCallum, and Strahan (1999) against the inclusion of single-item factors, EFA was rerun with a factor loading cut off of .40. Although the third factor only had a single high loading on a scale, further examination of eigenvalues and inspecting the scree plot suggested a two-factor solution, factors 1 and 2 reported above. Therefore, a two-factor solution was retained for further analyses (factor 3 excluded). Table 3.2 summarises the factor-loading pattern of the two extracted factors with eigenvalues exceeding 1 (Kaiser’s criterion), after rotation. These two factors were only moderately related with a correlation of *r* = −.27.

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

Table 3.1 – *Descriptive statistics and correlation matrix between measures of mindfulness, emotion regulation, and adult attachment (n = 174).*

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|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Mean | SD |  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| Mindfulness |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Act with awareness | 15.37 | 3.59 | 1 | - | .09 | .41\*\* | .32\*\* | .21\*\* | .66\*\* | .27\*\* | -.21\*\* | -.48\*\* | -.29\*\* | -.35\*\* |
| Observe/notice/attend | 13.69 | 3.34 | 2 | - | - | .02 | .03 | .18\* | .39\*\* | .10 | .01 | -.05 | .04 | .07 |
| Describe/label experience | 15.44 | 4.07 | 3 | - | - | - | .24\*\* | .25\*\* | .65\*\* | .15 | -.23\*\* | -.38\*\* | -.45\*\* | -.25\*\* |
| Non-judging of experience | 13.73 | 3.99 | 4 | - | - | - | - | .41\*\* | .67\*\* | .14 | -.01 | -.52\*\* | -.27\*\* | -.29\*\* |
| Non-reactivity | 14.98 | 3.93 | 5 | - | - | - | - | - | .68\*\* | .23\*\* | .03 | -.42\*\* | -.11 | -.07 |
| Total score | 73.21 | 11.67 | 6 | - | - | - | - | - | - | .29\*\* | -.14 | -.61\*\* | -.37\*\* | -.30\*\* |
| Emotion Regulation |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Cognitive reappraisal | 26.45 | 7.66 | 7 | - | - | - | - | - | - | - | .01 | -.31\*\* | -.19\* | -.20\*\* |
| Expressive suppression | 15.72 | 4.73 | 8 | - | - | - | - | - | - | - | - | .08 | .33\*\* | .23\*\* |
| Adult Attachment |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Anxiety | 3.85 | 1.16 | 9 | - | - | - | - | - | - | - | - | - | .36\*\* | .43\*\* |
| Avoidance | 3.56 | 0.95 | 10 | - | - | - | - | - | - | - | - | - | - | .52\*\* |
| Disorganised | 26.50 | 11.47 | 11 | - | - | - | - | - | - | - | - | - | - | - |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Table 3.2 – *Factors emerging from the exploratory factor analysis.*

|  |  |  |  |
| --- | --- | --- | --- |
|  | Factor 1 | Factor 2 |  |
| Mindfulness |  |  |  |
| Act with awareness |  | -.47 |  |
| Observe/notice/attend |  |  |  |
| Describe/label experience |  | -.56 |  |
| Non-judging of experience | .76 |  |  |
| Non-reactivity | .75 |  |  |
|  |  |  |  |
| Emotion Regulation |  |  |  |
| Cognitive reappraisal | .44 |  |  |
| Expressive suppression |  | .81 |  |
|  |  |  |  |
| Adult Attachment |  |  |  |
| Attachment anxiety | -.75 |  |  |
| Attachment avoidance |  | .73 |  |
|  |  |  |  |
| Disorganised attachment |  | .56 |  |
|  |  |  |  |

*Note.* Factor loadings < .4 are suppressed.

Factor 1; resilient mental functioning

Factor 2; disorganised emotional functioning

## 3.3.2. Coping as a Mediator Between Mental and Emotional Functioning and Psychological Well-being

Participant scores for factors 1 (resilient mental functioning) and 2 (disorganised emotional functioning) from the EFA were extracted and entered into the PROCESS macro as independent variables (IV) in the mediation model to test the mediating effects of coping behaviours in the relationship between the extracted factors and psychological well-being outcomes. The results from the mediation analyses for the effect of both coping subscales (activity and defeatism) on the relationship between the IV (factors extracted from EFA) and the dependent variables of psychological well-being (the six dimensions of the SPWB) and intent to drop out of university are summarised in Table 3.3.

As illustrated in Table 3.3, significant direct effects were reported between both factor 1 (resilient mental functioning) and factor 2 (disorganised emotional functioning), all six of the scales of psychological well-being (autonomy, environmental mastery, personal growth, positive relations with others, purpose in life, and self-acceptance), and intent to drop out of university. These direct effects indicate that both resilient mental functioning and disorganised emotional functioning are significant predictors of psychological well-being and drop out intent. Resilient mental functioning was associated with increased scores of psychological well-being variables while disorganised emotional functioning was negatively associated with the same outcomes.

No significant indirect effects via activity coping were reported for the relationships between factor 1 or factor 2 and the six scales of psychological well-being or intent to drop out, meaning that activity coping was not a significant mediator in these models. However, the indirect effect of factor 1 (resilient mental functioning) on five of the six scales of psychological well-being (environmental mastery, personal growth, positive relations, purpose in life, and self-acceptance) and intent to drop out, via defeatism coping, was significant. That is to say, defeatism coping partially mediated the effect of resilient mental functioning on most of the subscales of psychological well-being and intent to drop out. Coefficients for the relationships comprising these models can be seen in Fig. 3.1. Factor 2 (disorganised emotional functioning) had a significant indirect effect on all six scales of psychological well-being and intent to drop out via defeatism coping. That is to say, defeatism coping also partially mediated the relationship between disorganised emotional functioning, psychological well-being, and drop out intent. Coefficients for the relationships comprising these models can be seen in Fig 3.2

Table 3.3 – *Multiple mediation of the effects of extracted factors on mental health outcomes through facets of coping behaviours (5000 bootstrap samples; n = 174).*

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|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| IV | Mediator | DV | Total effect (c path) | Direct effect  (c’ path) | Total Indirect effect | |
| Point est. | 95% CI |
| Resilient mental | Activity coping | Autonomy | 3.19\*\*\* | 3.23\*\*\* | -0.04 | -0.25, 0.05 |
| functioning |  | Environmental mastery | 2.91\*\*\* | 2.96\*\*\* | -0.05 | -0.22, 0.09 |
|  |  | Personal growth | 2.51\*\*\* | 2.60\*\*\* | -0.08 | -0.37, 0.16 |
|  |  | Positive relations with others | 2.75\*\*\* | 2.88\*\*\* | -0.12 | -0.48, 0.24 |
|  |  | Purpose in life | 2.49\*\*\* | 2.57\*\*\* | -0.09 | -0.38, 0.16 |
|  |  | Self-acceptance | 4.51\*\*\* | 4.57\*\*\* | -0.05 | -0.28, 0.07 |
|  |  | Intent to drop out | -1.39\*\*\* | -1.41\*\*\* | 0.02 | -0.03, 0.15 |
|  | Defeatism coping | Autonomy | 3.19\*\*\* | 3.07\*\*\* | 0.12 | -0.48, 0.71 |
|  |  | Environmental mastery | 2.91\*\*\* | 2.18\*\*\* | 0.73\*\*\* | 0.32, 1.19 |
|  |  | Personal growth | 2.51\*\*\* | 1.82\*\*\* | 0.69\* | 0.10, 1.30 |
|  |  | Positive relations with others | 2.75\*\*\* | 1.90\*\*\* | 0.85\* | 0.28, 1.50 |
|  |  | Purpose in life | 2.49\*\*\* | 1.178\* | 1.30\*\*\* | 0.77, 1.94 |
|  |  | Self-acceptance | 4.51\*\*\* | 3.30\*\*\* | 1.21\*\*\* | 0.54, 1.93 |
|  |  | Intent to drop out | -1.39\*\*\* | -0.13 | -1.26\*\*\* | -1.78, -0.83 |

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

Table 3.3 – *continued.*

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|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| IV | Mediator | DV | Total effect (c path) | Direct effect  (c’ path) | Total Indirect effect | |
| Point est. | 95% CI |
| Disorganised  emotional functioning | Activity coping | Autonomy | -1.62\*\*\* | -1.63\*\*\* | 0.01 | -0.36, 0.32 |
|  | Environmental mastery | -2.24\*\*\* | -2.25\*\*\* | 0.01 | -0.24, 0.24 |
|  |  | Personal growth | -2.15\*\*\* | -1.93\*\*\* | -0.22 | -0.61, 0.01 |
|  |  | Positive relations with others | -4.04\*\*\* | -3.79\*\*\* | -0.25 | -0.68, -0.01 |
|  |  | Purpose in life | -2.68\*\*\* | -2.50\*\*\* | -0.18 | -0.61, 0.07 |
|  |  | Self-acceptance | -3.16\*\*\* | -3.26\*\*\* | 0.11 | -0.30, 0.51 |
|  |  | Intent to drop out | 1.74\*\*\* | 1.81\*\*\* | -0.08 | -0.29, 0.10 |
|  | Defeatism coping | Autonomy | -1.62\*\*\* | -0.99\* | -0.63\* | -1.14, -0.24 |
|  |  | Environmental mastery | -2.24\*\*\* | -1.46\*\*\* | -0.78\*\*\* | -1.23, -0.50 |
|  |  | Personal growth | -2.15\*\*\* | -1.48\*\*\* | -0.66\*\* | -1.19, -0.30 |
|  |  | Positive relations with others | -4.04\*\*\* | -3.58\*\*\* | -0.46\* | -0.90, -0.12 |
|  |  | Purpose in life | -2.68\*\*\* | -1.78\*\*\* | -0.90\*\*\* | -1.45, -0.50 |
|  |  | Self-acceptance | -3.16\*\*\* | -1.85\*\*\* | -1.31\*\*\* | -2.03, -0.80 |
|  |  | Intent to drop out | 1.74\*\*\* | 0.99\*\* | 0.75\*\*\* | 0.43, 1.18 |

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

*Figure 3.1 a – f*: Mediation models of the effects of resilient mental functioning on mental health outcomes through defeatism coping behaviours (5000 bootstrap samples).

Defeatism coping

-0.23\*\*\*

-3.22\*\*\*

Environmental mastery

Resilient mental functioning

2.18\*\*\*

Defeatism coping

-3.22\*\*\*

-0.22\*

Personal growth

Resilient mental functioning

1.82\*\*\*

Defeatism coping

-3.22\*\*\*

-0.26\*\*

Resilient mental functioning

Positive relations with others

1.90\*\*\*

Defeatism coping

-0.41\*\*\*

-3.22\*\*\*

Purpose in

life

Resilient mental functioning

1.18\*

*Figure 3.1 a – f*: continued.

Defeatism coping

-0.38\*\*\*

-3.22\*\*\*

Self

acceptance

Resilient mental functioning

3.30\*\*\*

Defeatism coping

-0.39\*\*\*

-3.22\*\*\*

Drop out

intent

Resilient mental functioning

-1.38\*\*\*

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

*Figure 3.2 a – g*: Mediation models of the effects of disorganised emotional functioning on mental health outcomes through defeatism coping behaviours (5000 bootstrap samples).

Defeatism coping

-0.28\*\*

2.24\*\*\*

Autonomy

Disorganised emotional functioning

-0.99\*

Defeatism coping

-0.35\*\*\*

2.24\*\*\*

Environmental mastery

Disorganised emotional functioning

-1.46\*\*\*

Defeatism coping

-0.30\*\*\*

2.24\*\*\*

Personal

growth

Disorganised emotional functioning

-1.48\*\*\*

Defeatism coping

-0.20\*\*

2.24\*\*\*

Positive relations with others

Disorganised emotional functioning

-3.58\*\*\*

*Figure 3.2 a – g*:continued*.*

Defeatism coping

-0.40\*\*\*

2.24\*\*\*

Purpose in

life

Disorganised emotional functioning

-1.79\*\*\*

Defeatism coping

-0.58\*\*\*

2.24\*\*\*

Self

acceptance

Disorganised emotional functioning

-1.85\*\*\*

Defeatism coping

0.33\*\*\*

2.24\*\*\*

Drop out

intent

Disorganised emotional functioning

1.74\*\*\*

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

# 3.4. Discussion

This study aimed to extend our current understanding of the relationship between attachment, mindfulness, and emotion regulation taking into account recent developments in the measurement of adult attachment, as well as specifically focusing on emotion regulation strategies. The present study assessed individual differences in the use of emotion regulation strategies and was the first study to examine the construct of adult disorganised attachment and its possible role in the relationship between adult attachment and dispositional mindfulness.

Consistent with previous research (Goodall et al., 2012), exploratory factor analysis was applied to measures of attachment (ECR-R, ADA), mindfulness (FFMQ-SF), and emotion regulation strategies (ERQ) in order to explore the relationships between constructs. A two-factor model was extracted. Factor 1 (accounting for 33% of the variance) consisted of positive loadings from the non-judging, and non-reacting of the FFMQ-SF, cognitive reappraisal of the ERQ, and a negative loading from attachment anxiety of the ECR-R. I suggest that this factor represents resilient mental functioning, which reflects an individual’s ability to protect themselves from the harmful effects of negative and maladaptive thought processes associated with an anxious insecure attachment and maladaptive emotion regulation strategies. More specifically, this extracted factor of resilient mental functioninghighlights the possible influence emotion regulation, the ability to successfully reappraise negative emotions, has on the relationship between adult attachment and dispositional mindfulness. From resilient mental functioning, as well as from the associations between constructs reported in the correlation matrix (Table 3.1), it is possible to suggest that low levels of attachment anxiety are associated with the execution of cognitive reappraisal strategies as a means to approach and resolve negative emotions and situations, which is further associated with an individual’s ability to remain in a non-judging and non-reactive state. The cross-sectional nature of the data precludes inferences about causality; however, the positive relationships observed imply that it is specifically the attitudinal component of mindfulness (acting with awareness, non-judgment and non-reactivity) that is associated with the use of adaptive emotion regulation. It may be that an attitude of non-judgment and non-reactivity may facilitate subsequent reappraisal of difficult emotions; alternatively, the reappraisal strategies may cultivate this attitude towards inner experiences.

Factor 2 (accounting for 14% of the variance) consisted of negative loadings from act with awareness and describe/label experience of the FFMQ-SF and positive loadings from expressive suppression of the ERQ, attachment avoidance of the ECR-R, and disorganised attachment of the ADA. This pattern reflects disorganised emotional functioning. To be more specific, I posit that this extracted factor highlights a possible interaction of the reliance on expressive suppression/the inability to reappraise negative emotions on the relationship between adult attachment and dispositional mindfulness. In this factor, the presence of both increased attachment avoidance, specifically a deactivation of the attachment system, and disorganisation are associated with a diminished ability to employ adaptive emotion regulation strategies (cognitive reappraisal), and negatively related to the act with awareness and describe facets of mindfulness (these associations are also present in the correlation matrix, see Table 3.1). These findings suggest that there is considerable overlap between dispositional mindfulness and emotion regulation strategies with regard to the awareness and acceptance of emotions and experiences in the context of a disorganised avoidant attachment.

In drawing comparison to the model reported by Goodall et al. (2012), the current study presents factor 1 as resilient mental functioning, a proactive and adaptive pattern of behaviour consisting of several subscales as a result of the assessment of emotion regulation strategies. Goodall et al. reported findings on the basis of emotion regulation difficulties, whereas the current study assessed specific strategies used to regulate emotions. Despite these differences, several commonalities should be noted. The present study replicated the loadings of the FFMQ subscales initially reported by Goodall et al. (non-judging, and non-reacting loading onto factor 1, describe loading onto factor 2, cross-loading of act with awareness, and the independent loading of the observe subscale on factor 3). Taken together, these results illustrate the seemingly clustered relationships between the FFMQ subscales and how their specific interactions relate to the constructs of adult attachment and emotion regulation. Goodall and colleagues explored emotion regulation using the DERS, measuring six subscales of emotion regulation difficulty. This measure included a subscale of limited access to emotion regulation strategies (which loaded onto factor 1 of their model) and demonstrated an interaction between constructs (with non-judging, and non-reacting scores negatively associated with a limited access to emotion regulation strategies). While placing a focus on adequately measuring emotion regulation strategies rather than difficulties, the present study successfully expands on the previous findings by reporting a positive relationship between the same mindfulness facets and cognitive reappraisal as a specific emotion regulation strategy, thus suggesting that these facets of mindfulness, and their interactions, are related to more effective emotion regulation due to the employment of adaptive emotion regulation strategies. Furthermore, the results from the current study expand our understanding of how less adaptive emotion regulation strategies relate to mindfulness: factor 2 of the present model demonstrates the negative relationship between expressive suppression as an emotion regulation strategy, and the mindfulness facets of act with awareness and describe.

As with the findings of Goodall et al. (2012), the factor structures reported here support the view that the relationship between emotion regulation and mindfulness may be bidirectional, with individuals utilising positive or adaptive emotion regulation strategies exhibiting increased dispositional mindfulness. The relationships observed between specific facets of mindfulness and emotion regulation are consistent with previous research on psychological well-being. Cash and Whittingham (2010) reported a higher degree of non-judging and acting with awareness aspects of mindfulness to be predictive of psychological well-being outcomes (including lower levels of depression, anxiety, and stress). Such findings could be attributed, in part, to the relationships and interactions between facets of mindfulness and emotion regulation strategies, as observed in the present study (see Table 3.2). These findings further detail the relationships between both the act with awareness and non-judging facets of mindfulness and adaptive emotion regulation (increased cognitive reappraisal and decreased expressive suppression), which have previously been reported to influence psychological well-being (Gross & John, 2003). Research has also highlighted the possible bidirectional relationship between attachment security and mindfulness: increased mindfulness has been found in those individuals exhibiting secure attachments, as well as mindfulness-based interventions leading to increased attachment security (Shaver et al., 2007).

A third factor was rejected from the final model as it loaded strongly on a single item only, the mindfulness subscale observe/notice/attend, replicating the findings of Goodall et al. (2012). Taken together, these results draw attention to the individual nature of the observe/notice/attend subscale of dispositional mindfulness, as measured by the FFMQ-SF. Baer et al. (2006) reported inconsistencies of the observe subscale in their results, suggesting this to be a result of the skill-like nature of observing in comparison to the other facets (which are primarily concerned with cognitions and emotions). Subsequent research utilising the FFMQ-SF to assess dispositional mindfulness has reported significant differences between individuals with prior meditation experience and those without (Goodall et al., 2012; Macaulay et al., 2015). Furthermore, research that assesses how facets of mindfulness relate to cognitive and emotional experiences similarly report that the observe facet behaves differently to other facets of mindfulness; for example, observe has been positively associated with negative cognitive experiences and distress (Emerson, Heapy, & Garcia-Soriano, 2018).

Both the present study and the work conducted by Goodall et al. (2012) employed the ECR-R to measure adult attachment, although the results differ from one another. Whereas Goodall et al. reported negative loadings from both attachment dimensions onto one factor in their model (factor 2/conscious awareness of emotional states), the present study reported separate factor loadings of the attachment dimensions. The final factor model reported a negative loading of attachment anxiety onto factor 1 (resilient mental functioning) and a positive loading of attachment avoidance onto factor 2 (disorganised emotional functioning). The results here suggest attachment anxiety to be negatively related to the mindfulness facets of non-judging and non-reactivity, while attachment avoidance is negatively related to the act with awareness and describe facets of dispositional mindfulness. For this reason, it is plausible to suggest that increased attachment anxiety inhibits the ability to engage in non-judging and non-reacting cognitive processes. Additionally, I posit that attachment avoidance not only results in behaviours of isolation regarding romantic relationships but, more broadly, throughout everyday life in response to individual experiences. Future research would be needed to test these ideas.

Although inconsistent with the previous findings, the separate loadings of the two primary attachment indices (anxiety and avoidance) in the present study lend support to the argument that they develop differently. The attachment literature proposes that insecurely attached individuals employ maladaptive cognitive strategies to process and manage emotional responses (Mikulincer & Florian, 1995, 1998). More specifically, attachment avoidance has been linked to the suppression and denial of emotional states (Mikulincer et al., 2003), while attachment anxiety has been linked to rumination and the intensification of negative/harmful emotional responses (Mikulincer & Shaver, 2007). The present research provides insight into the differences between attachment anxiety and avoidance in regard to emotion regulation and dispositional mindfulness. Additionally, this difference may be attributed to the inclusion of a measure of adult disorganised attachment. The relationship presented between attachment avoidance and disorganisation in the factor model may be, in part, due to the similarities in characteristics of attachment avoidance and disorganisation. To some degree, it could be argued that distancing and withdrawing behaviours in attachment avoidance are akin to the dissociative symptoms exhibited in adults with infant disorganised attachment (Ogawa et al., 1997). Widening the scope to include a measure of disorganised attachment provides further understanding of this attachment orientation in adulthood and also its relationship with emotion regulation and mindfulness.

While the model presented by Goodall et al. (2012) begins to examine the relationship between the three constructs, the current research presents a model that extends our understanding by presenting a fuller picture of adult attachment (inclusion of adult disorganised attachment) and emotion regulation (inclusion of strategies). In this way, the present study offers a representation of the diversity of attachment in the adult population and the recent developments in attachment research. The present research suggests how attachment orientations are related to emotion regulation strategies and may be instrumental in the development of dispositional mindfulness. Overall, these extensions to previous research have helped refine the assessment of the constructs of interest, as well as how they are related to and interact with one another.

## 3.4.1. Mediating Effects of Coping Behaviours

Researchers have previously reported the relationship between coping strategies and mental health outcomes. More specifically, studies have shown that attempting to avoid thoughts and feelings of stressors predicts an elevated level of distress (Rayburn et al., 2005; Stanton & Snider, 1993). Taylor and Stanton (2007) suggested that avoidance oriented coping behaviours may pre-empt more effective coping behaviours, including detrimental behaviours (e.g., substance abuse), or even induce intrusion of stress-related thoughts. Findings of the present study illustrate the processes underlying the association between the extracted factors (resilient mental functioning and disorganised emotional functioning) and psychological well-being outcomes (SPWB; Ryff, 1989) and intent to drop out of university from the implementation of activity-based or defeatism-based coping behaviours.

The results here indicate that the relationships between resilient mental functioning and all six of the psychological well-being outcomes and intent to drop out of university were not mediated by activity coping behaviours (such as expressing negative feelings and seeking emotional support). Such results support H3 and the theoretical interpretation of this factor as resilience. Higher levels of resilient mental functioning may indicate a capacity to assess and successfully cope with life stressors and issues with the constructs that all loaded onto this factor rather than through utilising activity coping behaviours themselves. Whether or not these factors are associated with activity coping behaviours does not appear to significantly affect psychological well-being or drop out intent as resilient mental functioning already encompass the necessary mechanisms to ensure positive and healthy mental functioning and appropriately deal with the unique stressors and demands of university life. However, results suggest that defeatism coping behaviours (such as substance use and denial) may be an important explanatory factor in the relationship between resilient mental functioning and five of the six psychological well-being outcomes (environmental mastery, personal growth, positive relations, purpose in life, and self-acceptance) and drop out intent, supporting H2 and H3. These results support the findings of Moritz et al. (2016) who reported a relationship between maladaptive coping behaviours and psychopathology. Moritz et al. additionally acknowledged that it is not only the increase of active coping behaviours that could benefit psychological well-being but also the decrease in maladaptive coping behaviours. Previous research has also documented some students choose to prematurely leave higher education when faced with greater social and emotional adjustment difficulties (Gerdes & Mallinckrodt, 1994). The results reported here support such findings as those individuals who are not able to appropriately deal with stressors are at greater risk of dropping out of university.

Similarly, our results indicate that the relationship between disorganised emotional functioning and the six psychological well-being outcomes and drop out intent is not accounted for by activity coping behaviours. Taken together, these results suggest that it is specifically defeatism coping behaviours that are significantly associated with psychological well-being and intention to drop out of university, even in relation to resilient mental functioning. These findings are supportive of H2 and H3. While researchers have previously reported dispositional mindfulness to be associated with lower psychological distress (Coffey & Hartman, 2008), the present study highlights that defeatism coping might be the mechanism for this association. Perhaps poor coping behaviours are a behavioural manifestation of low levels of mindfulness, and one that detrimentally impacts psychological well-being. These findings are supportive of H1, H2, and H3.

To my knowledge, there is no work exploring the associations between dispositional mindfulness (or mindfulness practice) and university drop out intent. Therefore, it is not possible to compare the present results with previous works. However, there is cause to reason that, as with psychological well-being, dispositional mindfulness is associated with diminished intentions to drop out of university - with defeatism coping as the mechanism for this association. It is possible that maladaptive coping behaviours are a manifestation of low levels of mindfulness which ultimately lead to the inability to adequately cope with the stressors of university life.

Not only does the present study highlight how certain factors relate to psychological well-being but the results also provide further insight into the interactions and relationships between dispositional mindfulness, emotion regulation, and adult attachment orientations. Specifically examining emotion regulation strategies has aided in furthering our understanding of the role these strategies play in the relationship between adult attachment and the development of dispositional mindfulness. While dispositional mindfulness is considered an inherent human capacity (Brown & Ryan, 2003), This chapter has highlighted the similarities between dispositional mindfulness and the constructs of adult attachment and emotion regulation. Accordingly, and unique to the present study, the role of dispositional mindfulness was examined as an important factor in a broader sense of mental functioning rather than isolating this construct and considering it to be, in itself, an overarching framework of mental health and well-being. Such results reiterate the importance of the education and execution of adaptive and proactive coping strategies as a means to promote and maintain positive mental health and psychological well-being and retention in higher education.

## 3.4.2. Limitations and Future Research

Issues may be raised with the reliability of the ERQ expressive suppression subscale (Cronbach’s α in the present sample was .66) and the SPWB environmental mastery subscale (Cronbach’s α in the present sample was .57). Although often cited as an acceptable standard, a reliability threshold of .70 is rule of thumb that is not without controversy (see Lance, Butts, & Michels, 2006). Additionally, an α value below the .70 threshold may be due to a low number of items included in the measure itself (Tavakol & Dennick, 2011). This explanation may be relevant for the ERQ expressive suppression subscale, which only has 4 items. That said, further analyses of the present sample determined there to be unidimensionality across all expressive suppression items and while .66 is not far below the “acceptable standard” threshold, caution should be taken when interpreting the results. The low reliability score for the SPWB environmental mastery could be a result of the undergraduate student sample used in the present study. Environmental mastery is regarded as the ability to manage complex environments to suit personal needs—a skill which might be particularly diversely expressed in a student population due to variety in workplace experience. That being said, students face a unique set of challenges in both social and academic situations. In light of this undesirable reliability score, future research may wish to focus specifically on student-based measures of psychological well-being to take these unique experiences and stressors into account (e.g., Broglia et al., 2017) or exclude the problematic subscale item(s) from analysis.

The present study relied on several self-report measures, including the FFMQ-SF to measure dispositional mindfulness. The scores reported in the present study reflect how participants scored on each of the five subscales. While the use of a self-report measure to assess predominantly internal mechanisms may increase the likelihood of biases within the present study, there are currently no observational methods for successfully measuring mindfulness (trait or state). Therefore, despite the inherent issues with self-report, the FFMQ (Baer et al., 2006) framework remains an appropriate way to tap the five individual facets of mindfulness. That being said, Van Dam et al. (2017) present arguments concerning the current conceptualisation of mindfulness, the potential benefits of “contemplative neuroscience,” and the implications of successfully measuring constructs at the neural level. Notably, the paper draws attention to the current semantic variations and lack of consensus surrounding the descriptions of mindfulness. Not only does this pose as an issue for our conceptualisation and understanding of this construct, but also for how it is effectively measured. The results of the present study, specifically the overlap between dispositional mindfulness, emotion regulation, and adult attachment orientations, further challenge the current conceptualisation of dispositional mindfulness. Additionally, from the presented results, it is possible to suggest that dispositional mindfulness is comparable to, or even someway influential in, both coping behaviours and psychological well-being. Future research could usefully build upon the current study by attempting to map these constructs at the neural level.

Considering the conceptualisation of mindfulness, and as we further develop our understanding, it would be beneficial to re-operationalise the definition of this construct and refine its measurement. While this is beyond the scope of the present study, the relationships observed between the constructs of adult attachment and emotion regulation may help form clearer definitions of what dispositional mindfulness is. However, we are still unsure of how these constructs are specifically related to one another. Future research may wish to continue utilising experimental design and behavioural indicators to successfully complement the current self-report measures of mindfulness to further examine the relationships between constructs (see Arch & Craske, 2006; Keng, Tan, Eisenlohr-Moul, & Smoski, 2017; Watford & Stafford, 2015). A recent meta-analysis of mindfulness and emotion regulation showcases methodological developments in this research field, and confirms the relationship between these constructs through experimental manipulation (Leyland, Rowse, & Emerson, 2018). Within the context of refinement and measurement, the present study aimed to further our understanding of coping and its relationship to the measured constructs by using an alternative scoring of the BriefCOPE (Carver, 1997) to produce two contrasting subscales (activity and defeatism; Mohr et al., 2014).

The findings from the present research are cross-sectional, and therefore, conclusions regarding causation cannot be drawn. Future research should examine these associations longitudinally and also assess the effect of mindfulness-based interventions to more accurately assess causation.

The findings speak to the particular setting of higher education in the UK. While this is a topic of particular interest in the current thesis, the sampling employed is not without limitation. Both the present study and the previous study conducted by Goodall et al. (2012) used single institution university student samples within the UK, as a result of opportunity sampling. It should be noted that while the contextual narrative of this doctoral thesis was to explicitly examine the relationship of these constructs in an undergraduate population, the generalisability of the results are still limited. The use of only one undergraduate sample, from one UK university, impede the generalisability of the results to wider student populations as different institutions present their own challenges alongside those traditionally faced by the majority of students. However, coping with the stressors of university life is a commonality between student populations and it is apparent that the coping strategies utilised by students can have a detrimental impact on their psychological well-being. To that end, it would be beneficial to expand this focus to include multiple institution samples, and more broadly situated than just the UK, to adequately capture the higher education context, and the way in which the constructs discussed here impact on students’ abilities to cope, or not, with the increasing pressures of contemporary student life (Broglia et al., 2017). Such research could inform the development of resources aimed at promoting positive student mental health and well-being.

At present, it is not known how generalisable the findings are to those individuals who are not currently enrolled in undergraduate education. As undergraduates face a set of very specific challenges and stressors, it would be beneficial for future research to concentrate on samples representing the general population, and assess the relationship between attachment orientation, mindfulness, emotion regulation, and coping in the general population, in different cultures.

The high attrition rate, while common in survey research with students, may have resulted in bias in our sample. Perhaps non-completers had different scores on some variable to completers. Future research would benefit from improved sampling to avoid this issue. As this was also the first study to examine the relationship between adult disorganised attachment and dispositional mindfulness, while the results point to a possible bidirectional relationship between attachment orientation and mindfulness, future longitudinal and experimental research would be beneficial to explore this possibility. In Chapters 4 and 5 I therefore utilise each of these methods respectively.

# Chapter 4. The Longitudinal Relationship Between Adult Attachment, Mindfulness, and Emotion Regulation and Their Influence on Psychological Well-being

# Abstract

Research has suggested that the relationship between adult attachment orientation and mindfulness is bidirectional. The primary aims of this study were to examine the directionality between these two constructs, their stability over time, and assess the predictive value of each construct on the other. Considering the similar positive outcomes associated with both adult attachment and mindfulness, the present study also aims to examine the relationships between these constructs and undergraduate student well-being and intention to drop out of higher education. A sample of university student participants (T1 *N* = 219, T2 *n* = 84) completed an online survey to assess attachment orientation, dispositional mindfulness, emotion regulation, perceived stress, coping behaviours, psychological well-being, and intent to drop out of university at two time-points, 15 weeks apart. Both attachment orientation and mindfulness remained stable between data collection points. However, contrary to previous research, the results presented here suggest the relationship between these constructs is not bidirectional. Following regression analyses, attachment anxiety emerged as a significant predictor of some facets of mindfulness but mindfulness was not a significant predictor of attachment orientation. Attachment orientation at T1 emerged as a significant predictor of emotion regulation, maladaptive coping behaviours, and environmental mastery while mindfulness emerged as a significant predictor of perceived stress. The results challenge popular theories regarding the relationship between adult attachment and mindfulness while providing much needed longitudinal data assessing the stability of dispositional mindfulness. Further, the results examine the predictive value of both constructs on psychological well-being amongst a student population.

# 4.1. Introduction

In response to the limitations of cross-sectional data pertaining to making inferences regarding causality raised in Chapters 2 and 3, the aim of the present chapter was to address these disadvantages of relying on cross-sectional data when studying the relationships between adult attachment orientation, mindfulness, and their influence on psychological well-being. At present, there is a lack of longitudinal data examining the relationship between these constructs. By assessing them over time, it is possible to begin to establish the direction of their association as well as the causality of their relationship.

In recent years, the construct of mindfulness has been widely researched and the available literature details the benefits of mindfulness and mindfulness interventions (see Baer, 2003). That being said, research has focused on the clinical implications of mindfulness (and its practice) and little is known about its development and the individual differences recorded in varying populations. Traditionally Buddhist in nature, the construct of mindfulness is often referred to as a state of consciousness in which individuals have an enhanced attention to their experiences (Brown & Ryan, 2003). Additionally, internal and external stimuli (such as thought, emotions, and physical sensations are noticed in a non-judgmental way. Shapiro, Carlson, Astin, and Freedman (2006) expanded on this and described mindfulness as involving three distinct components: intention, attention, and attitude. Additionally, Bishop et al. (2004) also proposed an attitudinal component in the operational definition of mindfulness, the orientation to experience. This orientation to experience is characterised by the ability to relate openly with the thoughts, feelings, and sensations that arise in our consciousness (Bishop et al., 2004).

As previously discussed, greater dispositional mindfulness has been associated with psychological well-being and positive moods, as well as lower levels of anxiety, stress, and depressive symptomology (Brown & Ryan, 2003; Carlson & Brown, 2005; Weinstein et al., 2009). Such associations have been attributed to the present moment awareness, or “continuous monitoring of experience with a focus on current experience rather than preoccupation with past or future events” (Cardaciotto et al., 2008, p. 5). However, it is apparent that individuals differ in their natural ability to be aware of their experiences, moment to moment, in such a non-judgmental way.

As we have seen in the previous chapters, one argument for these individual differences lies in the development of adult attachment orientations. Attachment theory (Bowlby, 1969) postulates that our attachment orientation style develops as a direct response to, and reflection of, the caregiving we receive from our primary caregivers. These experiences are thought to result in differences in the psychological organisation of the attachment system and lead to the development of internal working models of the self, others, and relationships that act as a framework in which we experience and deal with stressors and threats (Bowlby, 1969, 1973). Main, Kaplan, and Cassidy (1985) purported that these individual differences in attachment orientations can be viewed as “differences in the mental representations of the self in relation to attachment [and] the secure versus various types of insecure attachment organizations can best be understood as terms referring to particular types of internal working models of relationships, models that direct not only feelings and behavior but also attention, memory, and cognition” (p. 67).

Current conceptualisations of attachment style emphasise two primary dimensions of attachment insecurity: anxiety about abandonment and avoidance of intimacy (Bartholomew & Horowitz, 1991; Brennan et al.,1998). Attachment anxiety reflects a negative view of the self, an optimistic view of others, and is thought to develop as a result of caregivers’ inconsistency in availability and responsiveness. Those individuals scoring highly on attachment anxiety tend to engage in a hyperactivation of the attachment system, characterised by increased efforts to seek proximity and protection, a hypersensitivity to signs of rejection, and excessive rumination on relationship threats as well as one’s own shortcomings (Mikulincer & Florian, 1998). Attachment avoidance reflects a positive view of the self and negative beliefs about others which are a result of consistently rejection or non-responsive caregivers (Mikulincer & Shaver, 2003). In contrast, attachment avoidance is characterised by a deactivation of the attachment system characterised by avoidance of proximity seeking, denial of attachment needs, and the suppression of vulnerability thought to minimise emotional pain (Mancini, Robinaugh, Shear, & Bonanno, 2009; Mikulincer & Shaver, 2003; Mikulincer, Shaver, & Horesh, 2006).

Although adult attachment orientations are expected to change when faced with stressful life events that challenge existing representations, a level of stability is expected over a short-period of time. Throughout the literature, several longitudinal studies have reported this stability over periods of weeks to months (see Hammond & Fletcher, 1991; Scharfe & Bartholomew, 1994; Shaver & Brennan, 1992). According to attachment theory this stability is enabled by the ‘active process of construction’ (Scharfe & Bartholomew, 1994). Specifically, this is a direct outcome of individuals processing information and eliciting feedback that confirms their internal working models of themselves, others, and the world around them (e.g., Collins & Read, 1994; Main et al., 1985). This stability in attachment orientation over long timespans has been reinforced by Waters, Hamilton, and Weinfield (2000) who reported infant attachment patterns predicted attachment classification at 18 years old, as well as meta-analyses reporting the long-term stability of adult attachment security (e.g., Fraley, 2002; Pinquart, Feußner, & Ahnert, 2013). Specifically, Fraley (2002), reported that attachment security is moderately stable across the fist 19 years of life. However, a recent meta-analysis of longitudinal research by Pinquart and colleagues (2013) reported significant stability of attachment from early infancy to early adulthood, while no significant stability was reported for intervals larger than 15 years. Considering that childhood and adolescence are periods of significant cognitive, emotional, and social change, this recent work into attachment stability suggests that attachment security is indeed stable.

However, despite research seemingly supporting this perspective, discussion remains active surrounding the stability of individual differences in attachment orientation when viewed from personality/social-cognitive perspectives (see Fraley, 2002). Researchers have presented the counterargument that working models are fluid in nature, and should be sensitive to changes experienced in social environments (Kagan, 1996; Lewis, Feiring, & Rosenthal, 2000). Lewis and colleagues (2000) further proposed that while working models may be moderately resistant to change, the changes that do occur happen over time, thus making it difficult to predict future attachment orientations.

There are several similarities between the constructs of adult attachment and dispositional mindfulness, most notably that of attachment security. Ryan et al. (2007) proposed three distinct connections between felt attachment security and mindfulness. Firstly, those individuals who had experienced attentive and responsive caregiving are likely to not only exhibit secure attachment styles, but are also more mindful. Secondly, they placed emphasis on the possible bidirectionality of this relationship. They elaborate on the work of Hazan and Shaver (1994) stating that a secure attachment orientation fosters greater attentiveness to relational partners, as well as research suggesting that mindfulness is related to a secure adult attachment (Cordon & Finney, 2008; Hazan & Shaver, 1994). Conversely, it has been posited that mindfulness may facilitate secure attachments through open, receptive attention to relationship partners (Shaver et al., 2007). Finally, both attachment security and mindfulness contribute to a range of positive outcomes. Both of these constructs have been associated with positive mental and physical health, higher self-esteem, adaptive coping, and self-regulation (Ryan et al., 2007; Shaver et al, 2007).

Adults with different attachment orientations differ in the way in which they frame, approach, and cope with life stressors and stressful life experiences (Mikulincer & Florian, 1998). Shaver and Hazan (1994) postulated that, as in infancy, attachment insecurity (greater attachment anxiety and/or avoidance) in adulthood places individuals at risk of being ill-equipped to cope with such stressors. Research has documented the associations between attachment insecurity and both maladaptive and dysfunctional coping behaviours (Brennan & Shaver, 1995; Mikulincer et al., 1993; Pistole, 1995, 1996). Those individuals endorsing greater attachment anxiety or avoidance have been found to adopt emotion-focused and distancing coping strategies to deal with stress (Mikulincer & Florian, 1995; Ognibene & Collins, 1998).

Coping can be described as the cognitive and behavioural efforts that an individual uses to manage specific demands or stressors. Lazarus and Folkman (1984) distinguished between two types of coping strategies: problem-focused and emotion-focused. Problem-focused strategies are employed when an individual determines a harmful, threatening, or challenging situation is amenable to change. In other words, the individual that uses such strategies perceive the stressful situation to not only be changeable but also within their capabilities of control (Lazarus & Folkman, 1984). In contrast, emotion-focused coping strategies focus on the emotional responses (negative emotions) that are a product of stressful situations (Lazarus & Folkman, 1984). These strategies are employed when the individual sees the stressful situation as being outside of their immediate control. In particular, these strategies are employed when the individual has assessed and judged the situation as being unchangeable and that nothing can be done to alter the harmful, threatening, or challenging environment (Lazarus & Folkman, 1984).

University students face a unique set of challenges and stressors when enrolled in higher education (Broglia et al., 2017). Specific stressors and challenges associated with the demands of higher education may indeed be a trigger for the attachment system and, subsequently, associated coping behaviours. Research has long reported the negative association between undergraduate student stress and psychological well-being (Bailey & Miller, 1998; Dyson & Renk, 2006; Edwards, Hershberger, Russell, & Markert, 2001). Poor adjustment to higher education has been linked to poor academic performance and university dropout (Barr, 2007; Tinto, 1993). Moreover, students are more likely to leave higher education institutions prematurely when they face greater

social and emotional adjustment difficulties (Gerdes & Mallinckrodt, 1994). Those students who are ill-equipped, in terms of the efficacy of coping strategies, could be at risk and more susceptible to mental health issues as well as both academic and social failures. Ensuring that students are equipped with, and employ, effective coping behaviours when faced with the stressors the pursuit of higher education brings, it is important that we understand what leads individuals to employ such behaviours. Research has been conducted assessing the coping process associated with attachment anxiety and avoidance in undergraduate populations. Roberts, Gotlib, and Kassel (1996) reported the relationship between adult attachment dimensions and depression was mediated by dysfunctional attitudes and low self-esteem. Attachment anxiety and avoidance have also been linked to increase stress-related binge drinking and eating (Brennan & Shaver, 1995), dysfunctional forms of anger (Mikulincer, 1998), and emotional rumination (Pistole, 1995, 1996).

While there are a number of empirical studies examining this relationship between adult attachment and mindfulness (see Stevenson et al., 2017 [or Chapter 2] for review) uncertainty still remains regarding the stability and predictive nature of this relationship. While previous research has begun to examine the association between constructs, the inability to directly compare populations and lack of longitudinal research provides little basis to make any solid conclusions about the development of these two constructs, their relationship, or their predictive value on the other. Additionally, researchers have prioritised examining state measures of attachment and mindfulness (Melen, Pepping, & O’Donovan, 2016). To enrich and extend our current understanding of the relationship between these two constructs, research should address the paucity of available literature by shifting focus to establishing the relationship between these constructs at the dispositional level before attempting to manipulate them at state level.

**The Current Study**

The current study has multiple aims, incorporating both the main focus of this doctoral thesis on the relationship between attachment orientation and mindfulness, as well as the contextual narrative surrounding mental health and student dropout in higher education. Regarding the relationship between adult attachment orientation and mindfulness, this study will focus on the stability of both constructs over time. Assessing the stability of adult attachment and mindfulness over time will not only contribute to the on-going debate of the stability of attachment in adulthood (see Fraley, 2002) but will also provide much needed longitudinal data assessing the stability of dispositional mindfulness. Secondly, this study aimed to address the disadvantages of relying on cross-sectional data when studying the relationship between adult attachment and mindfulness and begin to establish the directionality of this association. Further to this, the present research aimed to explore the theory of bidirectionality of their relationship (Ryan et al., 2007; Shaver et al., 2007) by assessing the predictive value of each construct on the other between two time-points.

Throughout the literature, both adult attachment and mindfulness are consistently associated with to the same positive outcomes regarding one’s mental health and functioning (Ryan et al., 2007; Shaver et al., 2007) such as increased emotion regulation capacities (cognitive reappraisal), adaptive coping behaviours, lower levels of perceived stress, anxiety, depression, and increased mental well-being (Baer et al., 2012; Cordon et al., 2009; Stevenson, Millings, & Emerson, 2019; Walsh et al., 2009; Weinstein et al., 2009).

Considering these similarities, this chapter will also address issues of undergraduate psychological well-being, and intention to drop out of HE, from the perspective of adult attachment and mindfulness. While research is available detailing the associations between adult attachment and mindfulness and positive mental health outcomes, this study aims to gain a deeper understanding of these associations by examining the predictive value of both constructs on the aforementioned variables. This will not only give us a better understanding of whether adult attachment and mindfulness are predictive of these outcomes, but which construct, if not both, is more pertinent to psychological well-being.

Given the results of previous work (see Hammond & Fletcher, 1991; Scharfe & Bartholomew, 1994; Shaver & Brennan, 1992), which have consistently reported the stability of adult attachment, it was hypothesised that adult attachment orientation (anxiety and avoidance) would remain stable over the 15-week data collection period. And, consistent with theory (Ryan et al., 2007), the bidirectionality of the relationship between attachment orientation and mindfulness was anticipated to be evident over time. While there is little research examining the stability of mindfulness over time, this anticipation of a bidirectional relationship across two time points led to the hypothesis that mindfulness (total scores and each of the five individual facets) would also remain stable between data collection periods.

*H1: Both dimensions of attachment insecurity (anxiety and avoidance) and all 5 facets of mindfulness (act with awareness, observe, describe, non-judging, and non-reacting) will remain stable between data collection points.*

*H2: Both dimensions of attachment insecurity (anxiety and avoidance) will be negatively associated with 4 of the 5 facets of mindfulness (act with awareness, describe, non-judging, and non-reacting), all 6 psychological well-being outcomes, and drop out intent. While mindfulness (total score and the individual facets) will be positively associated with psychological well-being and negatively associated with drop out intent.*

*H3: The direction of the associations between attachment orientation (anxiety and avoidance) and the 5 facets of mindfulness will remain stable. The direction of the associations reported at T1 will also be reported at T2.*

*H4: Attachment orientation and mindfulness will be significant predictors of each other across time-points – evidencing the bidirectionality between constructs.*

As detailed throughout this thesis, attachment security and mindfulness have repeatedly been associated with the same positive mental health and well-being outcomes (e.g., Ryan et al., 2007, Shaver et al., 2007). Additionally, as reviewed in Chapter 2, both dimensions of attachment insecurity (anxiety and avoidance) are consistently associated with lower mindfulness (Stevenson et al., 2017) which has, in turn, been associated with maladaptive psychological functioning (e.g., Baer et al., 2006). Therefore, it is logical to suggest that increased attachment anxiety and/or avoidance and lower dispositional mindfulness would significantly contribute to the same mental well-being outcomes.

*H5: Attachment orientation and mindfulness (T1) would be significant predictors of the same psychological well-being outcomes (T2).*

# 4.2. Method

## 4.2.1. Participants and Procedure

Undergraduate students were recruited for course credit or prize draw entry, using Sona Systems subject pool software and a university-wide email distribution list, respectively. While only undergraduate students were permitted to take part in the study, the lower age limit was 18 years old while no upper age limit was imposed. Participants accessed the web-based survey via Qualtrics, which was live for a period of 3 weeks (T1). Participants were invited to complete the same questionnaire after an interval of 15 weeks (T2). Incomplete entries were discarded. In total, 219 completed the measures at time point 1 (T1) (68.5% female with a mean age of 19.42, *SD* = 2.87, range = 18- 47). Eighty-four of these participants successfully completed the same measures at time point 2 (T2) (77.4% British, 66.7% female with a mean age of 19.89, *SD* = 3.92, range 18 - 47). A majority of the participants were first year students (71.4%) and many of the participants were psychology students (35.7%). See Supplementary Table 4.1 for additional sample demographic characteristics. The minimum required sample size for bivariate correlations at T1 (*N* > 192) was determined using a-priori power analysis using G\*Power (Fault et al., 2009; Pearson’s *r* effect size 0.20, power 0.80, α = 0.05). The required sample size at T2 to conduct *t*-tests and multiple regression analyses (*N* > 67) was determined using the same programme (Cohen’s *d* effect size 0.35, power 0.80, α = 0.05; *f* effect size 0.20, power 0.80, α= 0.05).

## 4.2.2. Measures

### 4.2.2.1. Adult Attachment Orientation

The Revised Experiences in Close Relationships questionnaire (ECR-R; Fraley et al., 2000) was used to assess adult attachment orientation. As described in full in Chapter 3, the ECR-R is a 36-item self-report measure of two dimensions of adult attachment: anxiety (18 items) and avoidance (18 items). The Cronbach’s αcoefficients for the present sample were .91 (anxiety) and .87 (avoidance).

### 4.2.2.2. Mindfulness

As described in full in Chapter 3, the Five Facet Mindfulness Questionnaire Short Form (FFMQ-SF; Bohlmeijer et al., 2011) is a 24-item self-report measure of five subscales of dispositional mindfulness: act with awareness; observe; describe; non-judging; and non-reacting. In the present sample, the Cronbach’s α for each subscale of the FFMQ-SF are as follows: act with awareness (.78); observe (.72); describe (.81); non-judging (.75); and non-reacting (.79).

### 4.2.2.3. Emotion Regulation

The Emotion Regulation Questionnaire (ERQ; Gross & John, 2003), described in full in Chapter 3, was used to assess emotion regulation strategies using two subscales: cognitive reappraisal and expressive suppression. The Cronbach’s α coefficients of the reappraisal and suppression dimensions for the current sample were .86 and .70, respectively. Previous studies have shown acceptable internal consistencies that are slightly higher for the reappraisal than for the suppression subscale (Gross & John, 2003).

### 4.2.2.4. Perceived Stress

The Perceived Stress Scale (PSS; Cohen & Williamson, 1988) measures the degree to which respondents believe their lives have been unpredictable, uncontrollable, and overwhelming over the previous month. The original PSS has 14 item, however an abbreviated version of the PSS was used, which is comprised of 4 of the original items (PSS-4; Cohen, Kamarck, & Mermelstein, 1983). Participants were asked “In the last month, how often have you felt....,” followed by items including“…that things were going your way?” and “...confident about your ability to handle your personal problems?” and rated them using a 5-point Likert-scale ranging from 0 (*Never*) to 4 (*Very often*). The PSS-4 has been shown to have high internal consistency (α = .79; Karam et al., 2012). The Cronbach’s α for the current sample was .76.

### 4.2.2.5. Coping Behaviours

Coping was measured using the BriefCOPE (Carver, 1997), a 28-item self-report measure designed to assess 14 dimensions of coping, as detailed in full in Chapter 3. No total scores of coping are given; however, the coping dimensions have previously been combined into two subscales, “activity” and “defeatism” (see Mohr et al., 2014). Subscale scores were calculated for activity coping from 17 items and for defeatism coping from 11 items. Psychometric information was not reported in the original development of this scale. The Cronbach’s α coefficients for the current sample were .85 for the activity subscale and .78 for the defeatism subscale.

### 4.2.2.6. Psychological Well-being

Psychological well-being was measured using an abbreviated version of the Scales of Psychological Well-being (SPWB; Ryff, 1989). This 42-item scale, as detailed in full in Chapter 3, assesses six dimensions of psychological well-being: autonomy; environmental mastery; personal growth; self-acceptance; positive relations with others; purpose in life; and self-acceptance. In the current sample, the Cronbach’s α coefficients for all of the six dimensions were as follows: autonomy, .75; environmental mastery, .45; personal growth, .77; positive relations; .82; purpose in life, .75; and self-acceptance, .86. One item was dropped from the environmental mastery subscale (SPWB item 8) to improve the alpha to .76.

### 4.2.2.7. University Dropout

As detailed in Chapter 3, intentions to persist in, versus drop out of, university were assessed implementing the same method as Hardre and Reeve (2003). The Cronbach’s α for the current sample was .83.

**4.2.3. Statistical Analysis**

The alpha level was set to *p* < .05 for all statistical analyses. All variables but defeatism coping, intent to drop out, and two psychological well-being scales (autonomy and self-acceptance) were all found to be normally distributed, determined by the Shapiro-Wilk’s test of normality (*p*’s > .05). Considering the population, these deviations from normality reported in the present sample may reflect the individual differences reported in the ways individuals manage and tolerate stress (Lazarus & Folkman, 1984) which may also lend its hand to explain the deviation from normality in the ability of respondents to regulate their own behaviours independent of social pressures (autonomy) and the way in which they view themselves (self-acceptance). Further to this, intent to drop out of university scores also deviated from the pattern of normal distribution. This could reflect the severity of university dropout and how it is not necessarily a common occurrence, but rather specific to a group of very troubled individuals not distributed across the population. It is possible to suggest that the small sub-set of students who consider dropping out of university are not as well-equipped to deal with stressors, do not cope effectively as they may be swayed by the societal pressures of university, and, as a result, have negative self-views. As such, the measures were included in analysis as-is with no omissions (as in Chapter 3).

The data were analysed using a serious of Pearson’s correlations to examine the relationships between variables at T1 and T2, as well as between T1 and T2. A series of paired-samples *t*-tests were conducted to assess the stability of all constructs between the two time-points. Finally, hierarchical linear regression was utilised to assess the short-term predictive value of adult attachment and mindfulness on the other across time-points and also to assess their short-term predictive value of the included critical components pertinent to optimal psychological functioning and well-being. For each regression equation, the T1 score of the outcome variable was controlled for entering it at Step 1, followed by the appropriate predictor variable(s) at Step 2.

# 4.3. Results

After all incomplete entries were removed, a sample size of 219 was used for analysis for measures at T1 and a sample of 84 was used for analyses assessing measures at T1 and T2. Descriptive statistics and bivariate correlations for the two adult attachment dimensions, the five mindfulness facets, emotion regulation strategies, coping behaviours, perceived stress, scales of psychological well-being, and intent to drop out of university are presented in Tables 4.1 – 4.6.

Table 4.1 displays the mean scores and standard deviation for all measures used in this study. These scores have been calculated using three distinct samples; all T1 data (*n* = 219), T1 data for participants who completed both data collection points (*n* = 84), and T2 data for those participants who completed both data collection points (*n* = 84).

A series of independent *t*-tests were conducted to determine whether those participants who completed the study differed from those who did not. No significant differences were reported between groups for any of the included measures (adult attachment, mindfulness, emotion regulation, perceived stress, coping behaviours, psychological well-being, and drop out intent).

Table 4.1 - *Summary details of all measures at T1 (n =219), T1 (n = 84) and T2 (n = 84).*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Time-point 1  (*n =219*) | | Time-point 1  (*n* = 84) | | Time-point 2  (*n* = 84) | |
| **Measure** | **Mean** | **SD** | **Mean** | **SD** | **Mean** | **SD** |
| Adult Attachment |  |  |  |  |  |  |
| Anxiety | 4.02 | (1.14) | 4.03 | (1.19) | 4.10 | (1.21) |
| Avoidance | 3.60 | (0.96) | 3.66 | (0.96) | 3.70 | (0.96) |
| Mindfulness |  |  |  |  |  |  |
| Total | 71.9 | (11.22) | 72.64 | (12.79) | 73.89 | (13.40) |
| Act with awareness | 15.18 | (3.67) | 15.17 | (4.09) | 15.23 | (4.14) |
| Observe | 13.30 | (3.33) | 13.74 | (3.39) | 13.58 | (3.92) |
| Describe | 15.54 | (4.17) | 15.19 | (4.14) | 15.86 | (4.33) |
| Non-judging | 13.46 | (3.87) | 13.74 | (4.46) | 13.76 | (4.81) |
| Non-reacting | 14.42 | (3.98) | 14.81 | (4.33) | 15.46 | (4.11) |
| Emotion Regulation |  |  |  |  |  |  |
| Cognitive reappraisal | 26.53 | (7.68) | 25.88 | (7.46) | 25.49 | (9.00) |
| Expressive suppression | 15.96 | (5.55) | 16.23 | (5.34) | 15.06 | (4.95) |
| Perceived Stress | 7.81 | (3.13) | 7.83 | (3.33) | 7.48 | (3.02) |
| Coping Behaviours |  |  |  |  |  |  |
| Activity coping | 42.26 | (8.65) | 40.24 | (8.44) | 42.45 | (9.23) |
| Defeatism coping | 21.11 | (5.66) | 20.24 | (5.31) | 20.56 | (5.64) |
| Psychological Well-being |  |  |  |  |  |  |
| Autonomy | 26.72 | (6.21) | 26.56 | (6.31) | 26.40 | (6.57) |
| Environmental mastery | 22.45 | (5.55) | 22.30 | (4.33) | 22.00 | (4.46) |
| Personal growth | 31.50 | (5.99) | 31.67 | (6.10) | 30.45 | (6.46) |
| Positive relations | 29.46 | (7.02) | 29.94 | (7.15) | 29.55 | (7.06) |
| Purpose in life | 29.35 | (6.43) | 29.15 | (6.17) | 28.27 | (6.34) |
| Self-acceptance | 25.73 | (7.65) | 26.06 | (7.95) | 26.38 | (7.92) |
| University drop out | 5.71 | (3.96) | 5.12 | (3.24) | 6.29 | (4.00) |

Note. No significant differences were reported between those participants who completed data collection and those who did not for all of the included measures (all *p*’s > .05).

## 4.3.1. Relationship Between Variables

Tables 4.2 presents the bivariate correlation coefficients between attachment anxiety and avoidance and all 5 facets of mindfulness at T1 and T2 while Table 4.3 presents the same analyses between T1 and T2. At T1, attachment anxiety was significantly negatively correlated with total mindfulness, as well as with the individual subscales of act with awareness, describe, non-judging, and non-reacting*.* Attachment anxiety (T1) was also significantly negatively correlated with these subscales at T2. At T1, attachment avoidance was significantly negatively correlated with total mindfulness, as well as with act with awareness and describe. Again, the direction of these associations were the same between attachment avoidance (T1) and total mindfulness, act with awareness and describeat T2.

Table 4.4 present the bivariate correlation coefficients between attachment anxiety and avoidance, total mindfulness, and the included psychological well-being outcome variables at T1. At T1, attachment anxiety was significantly negatively correlated with cognitive reappraisal, total mindfulness, all six scales of psychological well-being (autonomy, environmental mastery, personal growth, positive relations, purpose in life, and self-acceptance), and significantly positively correlated with cognitive reappraisal, perceived stress, defeatism coping, and drop out intent. Attachment avoidance was significant negatively correlated with total mindfulness, expressive suppression, five of the six scales of psychological well-being (environmental mastery, personal growth, positive relations, purpose in life, self-acceptance), activity coping, and significantly positively correlated with cognitive reappraisal, perceived stress, defeatism coping, and drop out intent. Mindfulness was significantly negatively correlated with cognitive reappraisal, perceived stress, intent to drop out of university, defeatism coping, and was significantly positively correlated with all six scales of psychological well-being (autonomy, environmental mastery, personal growth, positive relations, purpose in life, and self-acceptance).

Presented in Table 4.5 are the bivariate correlation coefficients of variables at T2. At T2, attachment anxiety was significantly negatively correlated with total mindfulness, all six scales of psychological well-being (cognitive reappraisal, autonomy, environmental mastery, personal growth, positive relations, purpose in life, and self-acceptance), and significantly positively correlated with both activity and defeatism coping. Attachment avoidance was significantly negatively correlated with total mindfulness, cognitive reappraisal, five of the six scales of psychological well-being (environmental mastery, personal growth, positive relations, purpose in life, and self-acceptance), and significantly positively correlated with expressive suppression and drop out intent.

Finally, presented in Table 4.6 are the bivariate correlation coefficients between attachment anxiety and avoidance and total mindfulness (T1) and the psychological well-being outcomes (T2). The directionality of these relationships, for the most part, remained the same at T1 and T2 (this was the case for total mindfulness). However, when examining the correlations between variables across time-points the associations between attachment anxiety (T1) and activity coping (T2) and attachment avoidance (T1) and cognitive reappraisal, personal growth, purpose in life, and intent to drop out (T2) were non-significant.

Table 4.2 – *Correlation matrices for measures of adult attachment and mindfulness for all responders at T1 (below diagonal, n = 219) and complete responders at T2 (above diagonal, n = 84).*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 1. Attachment Anxiety | - | .15 | -.60\*\* | -.61\*\* | .09 | -.28\* | -.54\*\* | -.50\*\* |
| 2. Attachment Avoidance | .18\*\* | - | -.42\*\* | -.34\*\* | -.03 | -.54\*\* | -.23\* | -.16 |
| 3. Mindfulness Total | -.56\*\* | -.33\*\* | - | .70\*\* | .37\*\* | .67\*\* | .65\*\* | .73\*\* |
| 4. Act with awareness | -.37\*\* | -.29\*\* | .68\*\* | - | .02 | .34\*\* | .44\*\* | .39\*\* |
| 5. Observe | -.02 | .02 | .36\*\* | .07 | - | .12 | -.12 | .25\* |
| 6. Describe | -.29\*\* | -.42\*\* | .68\*\* | .39\*\* | .06 | - | .28\* | .35\*\* |
| 7. Non-judging | -.47\*\* | -.17\* | .60\*\* | .32\*\* | -.13 | .32\*\* | - | .33\*\* |
| 8. Non-reacting | -.46\*\* | -.06 | .59\*\* | .20\*\* | .16\* | .15\* | .20\*\* | - |

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

Table 4.3 – *Correlation matrix for measures of adult attachment (T1) and mindfulness (T2) (above diagonal, n = 84) and mindfulness (T1) and adult attachment (T2) (below diagonal, n = 84).*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 1. Attachment Anxiety | - | .101 | -.56\*\* | -.56\*\* | -.02 | -.18 | -.46\*\* | -.52\*\* |
| 2. Attachment Avoidance | .15 | - | -.33\*\* | -.26\* | -.11 | -.43\*\* | -.12 | -.11 |
| 3. Mindfulness Total | -.59\*\* | -.33\*\* | - | .70\*\* | -.37\*\* | .67\*\* | .65\*\* | .73\*\* |
| 4. Act with awareness | -.46\*\* | -.33\*\* | .74\*\* | - | .02 | .34\*\* | .44\*\* | .39\*\* |
| 5. Observe | -.12 | -.01 | .40\*\* | .13 | - | .12 | -.12 | .25\* |
| 6. Describe | -.23\* | -.47\*\* | .68\*\* | .47\*\* | .12 | - | .28\* | .35\*\* |
| 7. Non-judging | -.47\*\* | -.14 | .65\*\* | .44\*\* | -.03 | .29\*\* | - | .33\*\* |
| 8. Non-reacting | -.51\*\* | -.06 | .62\*\* | .24\* | .21 | .21 | .23\* | - |

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

Table 4.4 – *Correlation matrix for measures of adult attachment, mindfulness, and all well-being outcomes at T1(n = 219).*

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Cognitive reappraisal | Expressive suppression | Perceived Stress | Activity coping | Defeatism coping | Autonomy | Env. mastery | Personal growth | Positive relations | Purpose in life | Self-acceptance | Drop out |
| Attachment anxiety | -.25\*\* | .00 | .43\*\* | .12 | .44\*\* | -.39\*\* | -.47\*\* | -.32\*\* | -.30\*\* | -.33\*\* | -.45\*\* | .23\* |
| Attachment avoidance | -.30\*\* | .41\*\* | .29\*\* | -.25\*\* | .16\* | -.07 | -.40\*\* | -.33\*\* | -.69\*\* | -.34\*\* | -.42\*\* | .24\*\* |
| Total mindfulness | .31\*\* | -.12 | -.57\*\* | .17\* | -.42\*\* | .47\*\* | .61\*\* | .57\*\* | .42\*\* | .53\*\* | .63\*\* | -.44\*\* |

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

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Table 4.5 – *Correlation matrix for measures of adult attachment, mindfulness, and all well-being outcomes at T2 (n = 84).*

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Cognitive reappraisal | Expressive suppression | Perceived Stress | Activity coping | Defeatism coping | Autonomy | Env. mastery | Personal growth | Positive relations | Purpose in life | Self-acceptance | Drop out |
| Attachment anxiety | -.36\*\* | -.10 | .53\*\* | .22\*\* | .61\*\* | -.46\*\* | -.55\*\* | -.44\*\* | -.35\*\* | -.38\*\* | -.42\*\* | .19 |
| Attachment avoidance | -.27\*\* | .43\*\* | .42\*\* | .03 | -.05 | -.09 | -.45\*\* | -.23\* | -.67\*\* | -.25\* | -.46\*\* | .26\* |
| Total mindfulness | .36\*\* | -.25\*\* | -.71\*\* | .20 | -.46\*\* | .46\*\* | .62\*\* | .59\*\* | .58\*\* | .47\*\* | .69\*\* | -.33\*\* |

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

Table 4.6 – *Correlation matrix for measures of adult attachment and mindfulness (T1) and well-being outcomes (T2) for complete responders (n = 84).*

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|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Cognitive reappraisal (T2) | Expressive suppression (T2) | Perceived Stress (T2) | Activity coping (T2) | Defeatism coping (T2) | Autonomy (T2) | Env. Mastery (T2) | Personal growth (T2) | Positive relations (T2) | Purpose in life (T2) | Self-acceptance (T2) | Drop out (T2) |
| Attachment anxiety (T1) | -.31\*\* | -.11 | .49\*\* | .12 | .51\*\* | -.41\*\* | -.50\*\* | -.36\*\* | -.28\* | -.25\* | -.38\*\* | .13 |
| Attachment avoidance (T1) | -.20 | .38\*\* | .29\*\* | -.21 | .13 | -.07 | -.38\*\* | -.19 | -.62\*\* | -.20 | -.35\*\* | .18 |
| Total mindfulness (T1) | .38\*\* | -.10 | -.64\*\* | .19 | -.42\*\* | .46\*\* | .59\*\* | .53\*\* | .48\*\* | .46\*\* | .59\*\* | -.32\*\* |

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

## 4.3.2. Stability of Measures Over Time

The stability of adult attachment (ECR-R), mindfulness (FFMQ-SF), emotion regulation (ERQ), perceived stress (PSS-4), psychological well-being (SPWB), intent to drop out of university, and coping behaviours (BriefCOPE) over the 15-week period was examined. Paired samples *t*-tests were used to determine whether participant scores significantly differed between T1 and T2. All but two variables remained constant over time (i.e. there were no significant differences between T1 and T2 data). There was a significant difference in personal growth (SPWB) scores between T1 (*M* = 31.67, *SD* = 6.10) and T2 (*M* = 30.45, *SD* = 6.46); *t*(83) = 2.53, *p* = .013, and in intent to drop out scores between T1 (*M* = 5.12, *SD* = 3.24) and T2 (*M* = 6.29; *SD* = 4.00); *t*(83) = -2.90, *p* = .005. That is to say, participants sense of personal growth (an awareness or understanding of themselves, and as a result, experience changes in their feelings, beliefs, attitudes, or behaviours in a direction of improved effectiveness or health) significantly decreased over the 15-week period, while intent to drop out scores significantly increased.

## 4.3.3. Predictive Value of Variables

Hierarchical regression analyses were conducted to determine whether adult attachment orientation (ECR-R) and dispositional mindfulness (FFMQ-SF) were significant predictors of each other, emotion regulation, perceived stress, coping behaviours, and psychological well-being between T1 and T2 while controlling for T1 scores (see Table 4.7).

When predicting each of the individual facets of mindfulness, all of the regression models were reported as significant. However, only two of these models reported significant contributions from adult attachment dimensions. T1 attachment anxiety was a significant predictor of T2 act with awareness (*β* = -.29, *p* < .001) and non-judging (*β* = -.21, *p* = .049). Additionally, it should be noted that for observe*,* the individual contribution of attachment avoidance was approaching significance (*β* = -0.15, *p* = .052). Only the regression model for act with awareness indicated a significant ∆*R2* value, thus meaning adult attachment anxiety explained an additional 7% of unique variance of act with awareness at T2. Overall, the results of the regression analyses reveal a statistically significant relationship between attachment anxiety and the act with awareness and non-judging facets of mindfulness, over time. More specifically, greater attachment anxiety (T1) is indicative of a decreased ability to act with awareness and refrain from evaluating experiences (T2).

To examine the possible bidirectionality of this relationship, the equivalent analyses were conducted in the opposite direction, to assess whether T1 facets of dispositional mindfulness were significant predictors of adult attachment orientation at T2, after controlling for T1 attachment orientation. While both of the overall models were statistically significant, none of the mindfulness facets significantly individually contributed to the model in either case (see Table 4.7).

As previous research has emphasised the shared benefits of adult attachment and mindfulness, further hierarchical regression analysis was conducted to examine the predictive value of both attachment dimensions and total mindfulness scores (T1) for emotion regulation (ERQ), coping behaviours (BriefCOPE), the six scales of psychological well-being (SPWB), and intent to drop out of university (T2). As detailed in Table 4.7, all regression models were significant, although only 5 reported significant ∆*R2* values (act with awareness, expressive suppression, perceived stress, defeatism coping, and environmental mastery).

T1 attachment avoidance was a significant predictor of T2 expressive suppression (*β* = .26, *p* = .020). This regression model reported a significant ∆*R2* value, thus meaning attachment avoidance explained an additional 7% of unique variance of expressive suppression at T2. This statistically significant relationship suggests that higher attachment avoidance is indicative of a greater ability/tendency to suppress or mask emotional cues (such as facial expressions).

T1 total mindfulness was a significant predictor of T2 perceived stress (*β* = -.26, *p* = .046). This regression model reported a significant ∆*R2* value, thus meaning total mindfulness explained an additional 9% of unique variance of *perceived stress* at T2. That is to say, greater total mindfulness is indicative of lower levels of perceived stress.

T1 attachment anxiety was a significant predictor of T2 defeatism coping (*β* = .29, *p* = .004). This regression model reported a significant ∆*R2* value, thus meaning attachment anxiety explained an additional 6% of unique variance of defeatism coping at T2. That is to say, those exhibiting greater attachment anxiety at T1 are more likely to employ defeatism coping behaviours when dealing with stressors.

T1 attachment anxiety and avoidance were significant predictors of T2 environmental mastery (*β* = -.21, *p* = .043; *β* = -.18, *p* = .040, respectively). This regression model reported a significant ∆*R2* value, thus meaning attachment anxiety and avoidance explained an additional 12.1% of unique variance in environmental mastery at T2. These results reveal a statistically significant relationship between attachment orientation and the environmental mastery scale of psychological well-being. That is to say that greater attachment anxiety and avoidance (T1) are indicative of reduced abilities to manage everyday tasks and possess a sense of control over their external surroundings.

Table 4.7 – *Regression models assessing the predictive value of constructs between T1 and T2 (n = 84).*

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

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | | *t* | | *p* | | β | *F* | *df* | *p* | *R2* | ∆*R2* | *f2* |
| Act with Awareness (T2) | |  | | | | | | Total Model | | | | | |
| Step 1. | |  | |  | |  | | 98.88 | 1, 82 | <.001 | .55 | .55\*\*\* | 1.22 |
| Act with Awareness (T1) | | 9.94 | | <.001 | | .74 | |  |  |  |  |  |  |
| Step 2. | |  | |  | |  | | 42.48 | 3, 80 | <.001 | .61 | .07\*\* | 1.56 |
| Act with Awareness (T1) | | 7.42 | | <.001 | | .61 | |  |  |  |  |  |  |
| Attachment Anxiety (T1) | | -3.75 | | <.001 | | -.29 | |  |  |  |  |  |  |
| Attachment Avoidance (T1) | | -0.22 | | .824 | | -.02 | |  |  |  |  |  |  |
|  | |  | |  | |  | |  |  |  |  |  |  |
| Observe (T2) | |  | | | | | | Total Model | | | | | |
| Step 1. | |  | |  | |  | | 88.10 | 3, 80 | <.001 | .51 | .51\*\*\* | 1.04 |
| Observe (T1) | | 9.39 | | <.001 | | .72 | |  |  |  |  |  |  |
| Step 2. | |  | |  | |  | | 31.77 | 3, 80 | <.001 | .54 | .03 | 1.17 |
| Observe (T1) | | 9.65 | | <.001 | | .73 | |  |  |  |  |  |  |
| Attachment Anxiety (T1) | | 1.00 | | .32 | | .08 | |  |  |  |  |  |  |
| Attachment Avoidance (T1) | | -1.97 | | .05 | | -.15 | |  |  |  |  |  |  |
|  | |  | |  | |  | |  |  |  |  |  |  |
| Describe (T2) | |  | | | | | | Total Model | | | | | |
| Step 1. | |  | |  | |  | | 63.95 | 1, 82 | <.001 | .44 | .44\*\*\* | 0.79 |
| Describe (T1) | | 8.00 | | <.001 | | .66 | |  |  |  |  |  |  |
| Step 2. | |  | |  | |  | | 21.37 | 3, 80 | <.001 | .45 | .01 | 0.82 |
| Describe (T1) | | 5.86 | | <.001 | | .61 | |  |  |  |  |  |  |
| Attachment Anxiety (T1) | | -0.05 | | .962 | | -.00 | |  |  |  |  |  |  |
| Attachment Avoidance (T1) | | -1.00 | | .330 | | -.01 | |  |  |  |  |  |  |
|  | |  | |  | |  | |  |  |  |  |  |  |
| Non-judging (T2) | |  | | | | | |  | Total Model | | |  |  |
| Step 1. | |  | |  | |  | | 41.78 | 1, 82 | <.001 | .34 | .34\*\*\* | 0.52 |
| Non-judging (T1) | | 6.46 | | <.001 | | .58 | |  |  |  |  |  |  |
| Step 2. | |  | |  | |  | | 15.63 | 3, 80 | <.001 | .37 | .03 | 0.59 |
| Non-judging | | 4.44 | | <.001 | | .47 | |  |  |  |  |  |  |
| Attachment Anxiety (T1) | | -2.00 | | .049 | | -.21 | |  |  |  |  |  |  |
| Attachment Avoidance (T1) | | -0.22 | | .824 | | -.02 | |  |  |  |  |  |  |
|  | |  | |  | |  | |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | | *t* | | *p* | | β | *F* | *df* | *p* | *R2* | ∆*R2* | *f2* |
| Non-reacting (T2) | |  | | | | | | Total Model | | | | | |
| Step 1. | |  | |  | |  | | 58.40 | 1, 82 | <.001 | .42 | .42\*\*\* | 0.72 |
| Non-reacting (T1) | | 7.64 | | <.001 | | .65 | |  |  |  |  |  |  |
| Step 2. | |  | |  | |  | | 21.95 | 3, 80 | <.001 | .45 | .04 | 0.81 |
| Non-reacting (T1) | | 5.03 | | <.001 | | .54 | |  |  |  |  |  |  |
| Attachment Anxiety (T1) | | -1.65 | | .103 | | -.18 | |  |  |  |  |  |  |
| Attachment Avoidance (T1) | | -1.31 | | .194 | | -.11 | |  |  |  |  |  |  |
|  | |  | |  | |  | |  |  |  |  |  |  |
| Attachment Anxiety (T2) | |  | | | | | | Total Model | | | | | |
| Step 1. | |  | |  | |  | | 193.10 | 1, 82 | <.001 | .70 | .70\*\*\* | 2.33 |
| Attachment Anxiety (T1) | | 13.90 | | <.001 | | .84 | |  |  |  |  |  |  |
| Step 2. | |  | |  | |  | | 100.66 | 2, 81 | <.001 | .71 | .01 | 2.45 |
| Attachment Anxiety (T1) | | 11.91 | | <.001 | | .79 | |  |  |  |  |  |  |
| Act with Awareness (T1) | | -1.78 | | .08 | | -.12 | |  |  |  |  |  |  |
|  | |  | |  | |  | |  |  |  |  |  |  |
| Attachment Anxiety (T2) | |  | | | | | | Total Model | | | | | |
| Step 1. | |  | |  | |  | | 193.10 | 1, 82 | <.001 | .70 | .70\*\*\* | 2.33 |
| Attachment Anxiety (T1) | | 13.90 | | <.001 | | .84 | |  |  |  |  |  |  |
| Step 2. | |  | |  | |  | | 95.73 | 2, 81 | <.001 | .70 | .00 | 2.33 |
| Attachment Anxiety (T1) | | 13.70 | | <.001 | | .83 | |  |  |  |  |  |  |
| Observe (T1) | | -0.46 | | .646 | | -.03 | |  |  |  |  |  |  |
|  | |  | |  | |  | |  |  |  |  |  |  |
| Attachment Anxiety (T2) | |  | | | | | |  | Total Model | | |  |  |
| Step 1. | |  | |  | |  | | 193.10 | 1, 82 | <.001 | .70 | .70\*\*\* | 2.33 |
| Attachment Anxiety (T1) | | 13.90 | | <.001 | | .84 | |  |  |  |  |  |  |
| Step 2. | |  | |  | |  | | 95.38 | 2, 81 | <.001 | .70 | .00 | 2.33 |
| Attachment Anxiety (T1) | | 13.28 | | <.001 | | .84 | |  |  |  |  |  |  |
| Describe (T1) | | -0.08 | | .939 | | -.01 | |  |  |  |  |  |  |
| Attachment Anxiety (T2) | |  | | | | | |  |  | Total Model | |  |  |
| Step 1. | |  | |  | |  | | 193.10 | 1, 82 | <.001 | .70 | .70\*\*\* | 2.33 |
| Attachment Anxiety (T1) | | 13.90 | | <.001 | | .84 | |  |  |  |  |  |  |
| Step 2. | |  | |  | |  | | 95.97 | 2, 83 | <.001 | .70 | .00 | 2.33 |
| Attachment Anxiety (T1) | | 11.45 | | <.001 | | .82 | |  |  |  |  |  |  |
| Non-judging (T1) | | -0.60 | | .552 | | -.04 | |  |  |  |  |  |  |
|  | |  | |  | |  | |  |  |  |  |  |  |

Table 4.7 – *continued.*

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

Table 4.7 – *continued.*

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

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | | *t* | | *p* | | β | *F* | *df* | *p* | *R2* | ∆*R2* | *f2* |
| Attachment Anxiety (T2) | |  | | | | | | Total Model | | | | | |
| Step 1. | |  | |  | |  | | 193.10 | 1, 82 | <.001 | .70 | .70\*\*\* | 2.33 |
| Attachment Anxiety (T1) | | 13.90 | | <.001 | | .84 | |  |  |  |  |  |  |
| Step 2. | |  | |  | |  | | 95.54 | 2, 81 | <.001 | .70 | .00 | 2.33 |
| Attachment Anxiety (T1) | | 10.99 | | <.001 | | .85 | |  |  |  |  |  |  |
| Non-reacting (T1) | | 0.32 | | .748 | | .03 | |  |  |  |  |  |  |
|  | |  | |  | |  | |  |  |  |  |  |  |
| Attachment Avoidance (T2) | |  | | | | | | Total Model | | | | | |
| Step 1. | |  | |  | |  | | 163.42 | 1, 82 | <.001 | .67 | .67\*\*\* | 2.03 |
| Attachment Avoidance (T1) | | 12.78 | | <.001 | | .82 | |  |  |  |  |  |  |
| Step 2. | |  | |  | |  | | 81.42 | 2, 81 | <.001 | .67 | .00 | 2.03 |
| Attachment Avoidance (T1) | | 11.71 | | <.001 | | .80 | |  |  |  |  |  |  |
| Act with Awareness (T1) | | -0.69 | | .493 | | -.05 | |  |  |  |  |  |  |
|  | |  | |  | |  | |  |  |  |  |  |  |
| Attachment Avoidance (T2) | |  | | | | | | Total Model | | | | | |
| Step 1. | |  | |  | |  | | 163.42 | 1, 82 | <.001 | .67 | .67\*\*\* | 2.03 |
| Attachment Avoidance (T1) | | 12.78 | | <.001 | | .82 | |  |  |  |  |  |  |
| Step 2. | |  | |  | |  | | 81.45 | 2, 81 | <.001 | .67 | .00 | 2.03 |
| Attachment Avoidance (T1) | | 12.76 | | <.001 | | .82 | |  |  |  |  |  |  |
| Observe (T1) | | -0.46 | | .486 | | -.05 | |  |  |  |  |  |  |
|  | |  | |  | |  | |  |  |  |  |  |  |
| Attachment Avoidance (T2) | |  | | | | | |  | Total Model | | |  |  |
| Step 1. | |  | |  | |  | | 163.42 | 1, 82 | <.001 | .67 | .67\*\*\* | 2.03 |
| Attachment Avoidance (T1) | | 12.78 | | <.001 | | .82 | |  |  |  |  |  |  |
| Step 2. | |  | |  | |  | | 80.90 | 2, 81 | <.001 | .67 | .00 | 2.03 |
| Attachment Avoidance (T1) | | 13.28 | | <.001 | | .84 | |  |  |  |  |  |  |
| Describe (T1) | | -0.08 | | .939 | | -.01 | |  |  |  |  |  |  |
| Attachment Avoidance (T2) | |  | | | | | |  |  | Total Model | |  |  |
| Step 1. | |  | |  | |  | | 163.42 | 1, 82 | <.001 | .67 | .67\*\*\* | 2.03 |
| Attachment Anxiety (T1) | | 12.78 | | <.001 | | .82 | |  |  |  |  |  |  |
| Step 2. | |  | |  | |  | | 80.71 | 2, 83 | <.001 | .67 | .00 | 2.03 |
| Attachment Anxiety (T1) | | 12.52 | | <.001 | | .82 | |  |  |  |  |  |  |
| Non-judging (T1) | | -0.01 | | .992 | | -.00 | |  |  |  |  |  |  |
|  | |  | |  | |  | |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | | *t* | | *p* | | β | *F* | *df* | *p* | *R2* | ∆*R2* | *f2* |
| Attachment Avoidance (T2) | |  | | | | | | Total Model | | | | | |
| Step 1. | |  | |  | |  | | 163.42 | 1, 82 | <.001 | .67 | .67\*\*\* | 2.03 |
| Attachment Avoidance (T1) | | 12.78 | | <.001 | | .82 | |  |  |  |  |  |  |
| Step 2. | |  | |  | |  | | 82.81 | 2, 81 | <.001 | .67 | .00 | 2.03 |
| Attachment Avoidance (T1) | | 12.84 | | <.001 | | .82 | |  |  |  |  |  |  |
| Non-reacting (T1) | | -1.18 | | .240 | | -.08 | |  |  |  |  |  |  |
|  | |  | |  | |  | |  |  |  |  |  |  |
| Cognitive Reappraisal (T2) | |  | | | | | | Total Model | | | | | |
| Step 1. | |  | |  | |  | | 16.09 | 1, 82 | <.001 | .16 | .16\*\*\* | 0.19 |
| Cognitive Reappraisal (T1) | | 4.01 | | <.001 | | .41 | |  |  |  |  |  |  |
| Step 2. | |  | |  | |  | | 5.34 | 4, 79 | <.001 | .21 | .05 | 0.27 |
| Cognitive Reappraisal (T1) | | 2.83 | | .006 | | .31 | |  |  |  |  |  |  |
| Attachment Anxiety (T1) | | 0.82 | | .414 | | .11 | |  |  |  |  |  |  |
| Attachment Avoidance (T1) | | 0.46 | | .644 | | .05 | |  |  |  |  |  |  |
| Total Mindfulness (T1) | | -0.92 | | .360 | | -.14 | |  |  |  |  |  |  |
|  | |  | |  | |  | |  |  |  |  |  |  |
| Expressive Suppression (T2) | |  | | | | | | Total Model | | | | | |
| Step 1. | |  | |  | |  | | 28.08 | 1, 82 | <.001 | .25 | .25\*\*\* | 0.33 |
| Expressive Suppression (T1) | | 5.30 | | <.001 | | .51 | |  |  |  |  |  |  |
| Step 2. | |  | |  | |  | | 9.43 | 4, 79 | <.001 | .32 | .07\* | 0.47 |
| Expressive Suppression (T1) | | 4.04 | | <.001 | | .40 | |  |  |  |  |  |  |
| Attachment Anxiety (T1) | | 0.90 | | .369 | | .11 | |  |  |  |  |  |  |
| Attachment Avoidance (T1) | | -2.44 | | .017 | | -.25 | |  |  |  |  |  |  |
| Total Mindfulness (T1) | | 0.57 | | .570 | | .08 | |  |  |  |  |  |  |
|  | |  | |  | |  | |  |  |  |  |  |  |
| Perceived Stress (T2) | |  | | | | | |  | Total Model | | |  |  |
| Step 1. | |  | |  | |  | | 59.78 | 1, 82 | <.001 | .42 | .42\*\*\* | 0.72 |
| Perceived Stress (T1) | | 7.73 | | <.001 | | .65 | |  |  |  |  |  |  |
| Step 2. | |  | |  | |  | | 20.67 | 4, 79 | <.001 | .51 | .09\*\* | 1.04 |
| Perceived Stress (T1) | | 3.69 | | <.001 | | .39 | |  |  |  |  |  |  |
| Attachment Anxiety (T1) | | 1.37 | | .176 | | .14 | |  |  |  |  |  |  |
| Attachment Avoidance (T1) | | 0.78 | | .441 | | .07 | |  |  |  |  |  |  |
| Total Mindfulness (T1)  \**p* < .05; \*\**p* < .01; \*\*\**p* < .001 | | -2.03 | | .046 | | -.26 | |  |  |  |  |  |  |

Table 4.7 – *continued.*

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | | *t* | | *p* | | β | *F* | *df* | *p* | *R2* | ∆*R2* | *f2* |
| Activity Coping (T2) | |  | | | | | | Total Model | | | | | |
| Step 1. | |  | |  | |  | | 82.60 | 1, 82 | <.001 | .50 | .50\*\*\* | 1.00 |
| Activity Coping (T1) | | 9.09 | | <.001 | | .71 | |  |  |  |  |  |  |
| Step 2. | |  | |  | |  | | 20.48 | 4, 79 | <.001 | .51 | .01 | 1.04 |
| Activity Coping (T1) | | 7.66 | | <.001 | | .67 | |  |  |  |  |  |  |
| Attachment Anxiety (T1) | | 0.59 | | .558 | | .07 | |  |  |  |  |  |  |
| Attachment Avoidance (T1) | | -0.21 | | .832 | | -.02 | |  |  |  |  |  |  |
| Total Mindfulness (T1) | | 0.94 | | .349 | | .11 | |  |  |  |  |  |  |
| Defeatism Coping (T2) | |  | | | | | | Total Model | | | | | |
| Step 1. | |  | |  | |  | | 92.15 | 1, 82 | <.001 | .53 | .53\*\*\* | 1.13 |
| Defeatism Coping (T1) | | 9.60 | | <.001 | | .73 | |  |  |  |  |  |  |
| Step 2. | |  | |  | |  | | 27.87 | 4, 79 | <.001 | .59 | .06\* | 1.44 |
| Defeatism Coping (T1) | | 7.70 | | <.001 | | .65 | |  |  |  |  |  |  |
| Attachment Anxiety (T1) | | 2.96 | | .004 | | .29 | |  |  |  |  |  |  |
| Attachment Avoidance (T1) | | 1.32 | | .191 | | .10 | |  |  |  |  |  |  |
| Total Mindfulness (T1) | | 1.11 | | .271 | | .12 | |  |  |  |  |  |  |
|  | |  | |  | |  | |  |  |  |  |  |  |
| Autonomy (T2) | |  | | | | | | Total Model | | | | | |
| Step 1. | |  | |  | |  | | 132.09 | 1, 82 | <.001 | .62 | .62\*\*\* | 1.63 |
| Autonomy (T1) | | 11.49 | | <.001 | | .79 | |  |  |  |  |  |  |
| Step 2. | |  | |  | |  | | 34.55 | 4, 79 | <.001 | .64 | .02 | 1.78 |
| Autonomy (T1) | | 9.26 | | <.001 | | .73 | |  |  |  |  |  |  |
| Attachment Anxiety (T1) | | -1.56 | | .122 | | -.14 | |  |  |  |  |  |  |
| Attachment Avoidance (T1) | | 0.41 | | .686 | | .03 | |  |  |  |  |  |  |
| Total Mindfulness (T1) | | 0.13 | | .899 | | .01 | |  |  |  |  |  |  |
|  | |  | |  | |  | |  |  |  |  |  |  |
| Environmental Mastery (T2) | |  | | | | | |  | Total Model | | |  |  |
| Step 1. | |  | |  | |  | | 57.02 | 1, 82 | <.001 | .41 | .41\*\*\* | 0.69 |
| Environmental Mastery (T1) | | 7.55 | | <.001 | | .64 | |  |  |  |  |  |  |
| Step 2. | |  | |  | |  | | 22.38 | 4, 79 | <.001 | .53 | .12\*\*\* | 1.13 |
| Environmental Mastery (T1) | | 4.25 | | <.001 | | .40 | |  |  |  |  |  |  |
| Attachment Anxiety (T1) | | -2.05 | | .043 | | -.21 | |  |  |  |  |  |  |
| Attachment Avoidance (T1) | | -2.09 | | .040 | | -.18 | |  |  |  |  |  |  |
| Total Mindfulness (T1)  \**p* < .05; \*\**p* < .01; \*\*\**p* < .001 | | 1.46 | | .149 | | .17 | |  |  |  |  |  |  |

Table 4.7 – *continued.*

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | | *t* | | *p* | | β | *F* | *df* | *p* | *R2* | ∆*R2* | *f2* |
| Personal Growth (T2) | |  | | | | | | Total Model | | | | | |
| Step 1. | |  | |  | |  | | 109.43 | 1, 82 | <.001 | .57 | .57\*\*\* | 1.33 |
| Personal Growth (T1) | | 10.46 | | <.001 | | .76 | |  |  |  |  |  |  |
| Step 2. | |  | |  | |  | | 29.26 | 4, 79 | <.001 | .60 | .03 | 1.50 |
| Personal Growth (T1) | | 7.86 | | <.001 | | .71 | |  |  |  |  |  |  |
| Attachment Anxiety (T1) | | -1.08 | | .285 | | -.10 | |  |  |  |  |  |  |
| Attachment Avoidance (T1) | | 1.15 | | .254 | | .09 | |  |  |  |  |  |  |
| Total Mindfulness (T1) | | 0.62 | | .535 | | .07 | |  |  |  |  |  |  |
| Positive Relations (T2) | |  | | | | | | Total Model | | | | | |
| Step 1. | |  | |  | |  | | 90.24 | 1, 82 | <.001 | .52 | .52\*\*\* | 1.08 |
| Positive Relations (T1) | | 9.50 | | <.001 | | .72 | |  |  |  |  |  |  |
| Step 2. | |  | |  | |  | | 25.49 | 4, 79 | <.001 | .56 | .04 | 1.27 |
| Positive Relations (T1) | | 4.16 | | <.001 | | .49 | |  |  |  |  |  |  |
| Attachment Anxiety (T1) | | -0.51 | | .612 | | -.05 | |  |  |  |  |  |  |
| Attachment Avoidance (T1) | | -1.90 | | .060 | | -.21 | |  |  |  |  |  |  |
| Total Mindfulness (T1) | | 1.21 | | .230 | | .13 | |  |  |  |  |  |  |
|  | |  | |  | |  | |  |  |  |  |  |  |
| Purpose in Life (T2) | |  | | | | | | Total Model | | | | | |
| Step 1. | |  | |  | |  | | 104.68 | 1, 82 | <.001 | .56 | .56\*\*\* | 1.27 |
| Purpose in Life (T1) | | 10.23 | | <.001 | | .75 | |  |  |  |  |  |  |
| Step 2. | |  | |  | |  | | 25.80 | 4, 79 | <.001 | .57 | .01 | 1.33 |
| Purpose in Life (T1) | | 7.99 | | <.001 | | .71 | |  |  |  |  |  |  |
| Attachment Anxiety (T1) | | 0.12 | | .903 | | .01 | |  |  |  |  |  |  |
| Attachment Avoidance (T1) | | 0.31 | | .761 | | .02 | |  |  |  |  |  |  |
| Total Mindfulness (T1) | | 0.86 | | .393 | | .10 | |  |  |  |  |  |  |
|  | |  | |  | |  | |  |  |  |  |  |  |
| Self-acceptance (T2) | |  | | | | | |  | Total Model | | |  |  |
| Step 1. | |  | |  | |  | | 141.48 | 1, 82 | <.001 | .63 | .63\*\*\* | 1.70 |
| Self-acceptance (T1) | | 11.90 | | <.001 | | .80 | |  |  |  |  |  |  |
| Step 2. | |  | |  | |  | | 34.75 | 4, 79 | <.001 | .64 | .01 | 1.78 |
| Self-acceptance (T1) | | 7.58 | | <.001 | | .78 | |  |  |  |  |  |  |
| Attachment Anxiety (T1) | | 0.20 | | .846 | | .02 | |  |  |  |  |  |  |
| Attachment Avoidance (T1) | | -0.68 | | .497 | | .05 | |  |  |  |  |  |  |
| Total Mindfulness (T1)  \**p* < .05; \*\**p* < .01; \*\*\**p* < .001 | | 0.70 | | .485 | | .08 | |  |  |  |  |  |  |

Table 4.7 – *continued.*

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | | *t* | | *p* | | β | *F* | *df* | *p* | *R2* | ∆*R2* | *f2* |
| Drop Out Intent (T2) | |  | | | | | | Total Model | | | | | |
| Step 1. | |  | |  | |  | | 26.80 | 1, 82 | <.001 | .25 | .25\*\*\* | 0.33 |
| Drop Out Intent (T1) | | 5.18 | | <.001 | | .50 | |  |  |  |  |  |  |
| Step 2. | |  | |  | |  | | 6.75 | 4, 79 | <.001 | .26 | .01 | 0.35 |
| Drop Out Intent (T1) | | 3.90 | | <.001 | | .45 | |  |  |  |  |  |  |
| Attachment Anxiety (T1) | | -0.49 | | .623 | | -.06 | |  |  |  |  |  |  |
| Attachment Avoidance (T1) | | -0.12 | | .909 | | -.01 | |  |  |  |  |  |  |
| Total Mindfulness (T1) | | -0.93 | | .353 | | -.14 | |  |  |  |  |  |  |

Table 4.7 – *continued.*

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

# 4.4. Discussion

A core aim of this study was to examine the stability of adult attachment and dispositional mindfulness over time as well as to determine the predictive validity of each construct on the other and psychological well-being outcomes between T1 and T2. By collecting data at two time-points I have been able to examine the (i) stability over time in attachment orientation and mindfulness, and (ii) directionality of the relationship between the two. Therefore, successfully establishing whether one construct was significant in predicting the other.

Additionally, I have been able to establish the predictive value of both constructs on important variables pertinent to student mental health and well-being.

## 4.4.1. Stability of Variables Over Time

In the present study, no significant differences were reported for attachment anxiety and avoidance or for any facet of mindfulness over the 15-week period, supporting H1. These findings are consistent with previous research reporting the stability of adult attachment dimensions over time using both self-report measures and semi-structured interviews (Hammond & Fletcher, 1991; Levy & Davis, 1988; Scharfe & Bartholomew, 1994; Shaver & Brennan, 1992). To my knowledge, there is no literature detailing the stability of dispositional mindfulness. The results of the present study add to our current understanding by highlighting the short-term stability of this construct.

All other variables remained stable except for personal growth (SPWB) and intent to drop out of university. Given the undergraduate sample used in this study, the results are not surprising. Throughout their academic life, students face a unique set of challenges which was taken into consideration when determining the data collection points – as to avoid exam/coursework periods which may have influenced the results. Therefore, the two time-points were in October (T1) and March (T2) – dates varied depending on when each participant completed the measures at T1, the average being 15 weeks (participants were given a total of 14 days to complete data collection at T2, those who completed after this time period were removed prior to data analysis). It is possible to argue that the significant decline in personal growth and increase in drop out intent was not directly related to pre-exam stress prior to the winter exam period, as data collection concluded after exams scheduled in January. However, it is possible that the significant differences recorded are a result of students receiving their exam results. Undesirable exam results could conceivably result in despondency and a diminished understanding of themselves in the academic world, resulting in a greater propensity of considering dropping out of HE.

## 4.4.2. Relationship Between Variables

It is notable that the relationships reported in the present study (see Table 4.2 – 4.4) do not reflect all of those reported in a recent meta-analysis examining the relationship between adult attachment orientation and mindfulness (Stevenson, et al., 2017). The results of the meta-analysis detailed significant negative associations between attachment anxiety and the act with awareness, describe, non-judging, and non-reacting facets of mindfulness as well as between attachment avoidance and all five facets. However, in the present study, when examining the bivariate relationships between constructs (at T1 and T2, and between both time points), no significant associations were reported between attachment avoidance and the observe facet, partially supporting H2. This disparity may be a result of cultural differences, as reported in the meta-analysis, a total of 20 (out of 33) studies relied on undergraduate student samples, 11 of which were from the USA. However, Goodall and colleagues (2012), using a UK undergraduate student sample, did not report significant associations between either attachment dimension and observe.

Interestingly, attachment anxiety (T1) was negatively associated with act with awareness, non-judging, and non-reacting at T2. Stevenson and colleagues (2017) proposed that a hyperactivation of the attachment system, characteristic of attachment anxiety, may hinder the optimal fostering of essential underpinning constructs of mindfulness (including act with awareness, non-judging, and non-reacting). Hyperactivation of the attachment system, results in hypervigilance and a heightened sensitivity towards signs of rejection (Mikulincer & Florian, 1998). Hypervigilence may be incompatible with the ability to act with awareness and to be nonreactive because attending to potential rejection cues depletes cognitive resources. Furthermore, attachment anxiety is underpinned by a negative view of self, and disbelief in the self as loveable (Bartholomew & Horowitz, 1991), hence a stance of non-judging one’s inner experience may be particularly difficult for those high in attachment anxiety to achieve.

The associations reported between attachment avoidance (T1) and act with awareness and observe (T1 and T2) are consistent with the possibility of a deactivation of the attachment system (Mikulincer & Shaver, 2003). This deactivation is characterised by an avoidance of proximity seeking, denial of attachment needs, and also a suppression of signs of vulnerability, which are reflected in lower scores of act with awareness and observe. That is to say, those individuals who report higher levels of attachment avoidance are less likely to attend fully to their surroundings, emotions, and experiences (act with awareness) and are less likely to effectively notice external and internal stimuli (observe). It should be noted that while both attachment anxiety and avoidance have a documented, negative relationship with the mindfulness facet act with awareness, I propose that they do so via different mechanisms.

Specifically, I propose that the ability to attend to one’s present experiences (act with awareness)is dependent on the organisation of the intrinsic attachment system. A hyperactivation of the attachment system (attachment anxiety) and a hypervigilance to signs of rejection does not allow for the mental capacity, or rationality, due to depleted mental resources, to attend to one’s surroundings in such a manner. Simply stated, and by no means reductive, those high in attachment anxiety have their attention focused elsewhere. Similarly, a deactivation of the attachment system (attachment avoidance) is also negatively associated with one’s ability to act with awareness which can be attributed to their avoidance of proximity seeking. These individuals are not searching for, or sensitive to, signs of either acceptance or rejection from close others. While the mental resources may indeed be available for those high in attachment-avoidance, the willingness, or interest, to allocate them is absent.

## 4.4.3. Directionality of Relationships Between Variables

### 4.4.3.1. Adult Attachment and Mindfulness

To test the predictive value of adult attachment and dispositional mindfulness on one another, hierarchical regression analyses were conducted to determine the direction of the relationship between these constructs (see Table 4.7). Out of all of the regression models, only attachment anxiety (T1) emerged as a significant predictor for act with awareness and non-judging (T2), thus suggesting that the relationship between these constructs is not bidirectional as suggested in the current literature. If this relationship was bidirectional in nature, I would have expected both constructs measured at T1 to contribute significantly to the prediction of the other at T2. However, this was not the case in the present study. It is therefore possible to conclude that the facets of mindfulness (as measured by the FFMQ-SF) were not significant in predicting adult attachment dimensions, whereas attachment anxiety was predictive of some aspects of mindfulness, partially supporting H4.

Attachment anxiety is regarded as the heightened sensitivity to abandonment at the hands of loved ones as well as increased proximity and protection seeking efforts, hypersensitivity to signs of rejection, and a tendency to ruminate on one’s own shortcomings (Mikulincer & Florian, 1998). Such behaviours are reflected in the mindfulness facets act with awareness and non-judging. Research has reported these two facets to be significant in predicting similar mental health outcomes as attachment anxiety. More specifically, act with awareness has been associated with lower levels of depressive symptomology while non-judging was found to predict lower levels of depression, stress, and general anxiety symptomology (Cash & Whittingham, 2010). These findings suggest that attachment anxiety, and subsequent hyperactivation of the attachment system, impedes the capacity for mindfulness. A possible mechanism for this could be emotion regulation abilities, highlighted in previous research as a commonality between the two constructs (Stevenson et al., 2019). Those high in attachment anxiety tend to be at the mercy of their emotions, struggle to self-sooth (Mikulincer & Shaver, 2007) and have negative self-views (Bartholomew & Horowitz, 1991). These characteristics are in opposition to acting with awareness and non-judging, which require an engagement with present-moment actions and a non-critical view of the self and internal experiences. Thus, although mindfulness can help recovery from negative affect (Leyland et al., 2018), attachment anxiety may interfere with this process.

The reported significance of attachment anxiety at T1 in predicting these subscales at T2 may be a result of the chronic hyperactivation of the attachment system. Stevenson and colleagues (2017) proposed that this hyperactivation of the attachment system may hinder the optimal fostering of essential underpinning constructs of mindfulness (including act with awareness and non-judging). Therefore, it is possible to propose that not only does a hyperactivation of the attachment system negatively impact facets of mindfulness, but it is also predictive of these facets 15-weeks later.

### 4.4.3.2. Adult Attachment, Mindfulness, and Well-being

It is also pertinent to discuss the predictive value of both constructs (attachment and mindfulness) in relation to optimal psychological functioning and well-being. In the present study participant’s emotion regulation strategies, coping behaviours, perceived stress, and psychological well-being were measured. Additionally, utilising a sample of undergraduate students not only provided an appropriate context to examine these constructs a group but it also provides us with an example of a clear real-world outcome – to drop out of university or not.

Attachment avoidance emerged as a significant predictor of the emotion regulation strategy expressive suppression. That is to say, greater attachment avoidance (T1) was indicative of a greater, or more frequent, use of expressive suppression (T2). This emotion regulation strategy is characterised by the voluntary, conscious suppressing of outward emotional expressions and cues (Gross & Levenson, 1993). These individuals are thought to attempt to block or inhibit emotional states that are incongruent with the goal of keeping their attachment system deactivated and, as such, attachment avoidance has repeatedly been associated with expressive suppression (Mikulincer & Shaver, 2003).

Attachment anxiety emerged as a significant predictor of defeatism coping behaviours. That is to say, greater attachment anxiety (T1) is indicative of an increased utilisation of substance use, denial, self-blame, self-distraction, and behavioural disengagement to cope with stress (T2). Researchers have previously reported the relationship between coping strategies and mental health outcomes. Specifically, research has shown that attempting to avoid thoughts and feelings of stressors predicts an elevated level of distress (Rayburn et al., 2005; Stanton & Snider, 1993). Therefore, it is possible to suggest that those individuals exhibiting greater attachment anxiety, over time, will experience greater distress as they are ill-equipped to effectively cope with stressors.

Both dimensions of adult attachment (T1) emerged as significant predictors of SPWB environmental mastery(T2), partially supporting H5*.* Thus, those exhibiting greater attachment insecurity (high anxiety and avoidance) are likely to face greater difficulties adapting to their university surroundings and successfully meeting the demands of HE. The exploration behavioural system can be used to explain such difficulties. As discussed in Chapter 1, the attachment behavioural system is an innate behavioural system responsible for the formation, maintenance, and internalisation of close relationships (Bowlby, 1969; Mikulincer & Shaver, 2007) with the goal of restoring felt security. Once felt security is achieved, and the attachment system is neither in a state of hyperactivation or deactivation, effective exploration can take place (Mikulincer & Shaver, 2007). In a recent study into adult attachment orientation and well-being, Sirois, Millings, and Hirsch (2016) reported attachment insecurity was associated with a deactivation of the exploration system and, subsequently, lower well-being. They purported that information processing biases associated with this deactivation of the exploration system detrimentally affects the perception of social support and, subsequently, well-being. It is possible that this is occurring in the present study with attachment insecurity (in this case both attachment anxiety and avoidance) not only inhibiting the way in which students adapt to the demands of university life but also, specific to the attachment system, the exploration, formation, and maintenance of relationships in a socially demanding environment such as HE. In turn, this may contribute to negative short- and long-term outcomes and may persist throughout their undergraduate education.

Total mindfulness scores (T1) emerged as a significant predictor of lower perceived stress (T2). This is consistent with the substantial body of literature investigating the relationship between dispositional mindfulness and perceived stress with many studies reporting negative correlations between the two constructs (e.g., Black, Sussman, Johnson, & Milam, 2012; Gard et al., 2012; Weinstein et al., 2009). Perceived stress has also been found to decrease following Mindfulness-based stress reduction (MBSR) interventions, which also increase dispositional mindfulness (e.g., Baer et al., 2012; Carmody, Baer, Lykins, & Olendzki, 2009). Therefore, introducing mindfulness-based practice and interventions to university students may be an effective way for them to deal with the stressors associated with HE.

## 4.4.4. Study Limitations and Future Directions

The primary limitations of the present study include the generalisability of the sample and the reliance on self-report measures. The majority of the sample in this study identified as female (66.7%) and the sample was limited to undergraduate students at a single university. These factors affect the ability to generalise findings to a broader population. Even though the contextual narrative of this thesis focuses primarily on the psychological well-being and undergraduate student dropout, the use of only one undergraduate sample, from one UK university, impedes the generalisability of the results to wider student populations. To determine whether the results of the present study are indicative of the experiences of the wider undergraduate student body or whether they are specific to the single university used for data collection, future research should consider utilising the same study design to provide a better understanding of undergraduate student psychological well-being and factors that influence dropout. Initially, this research should be first conducted across the UK then spread to global higher education institutions.

The second limitation pertains to the reliance on self-report data. The method of self-report data collection was chosen for a myriad of reasons, including accessibility, easier access to a larger sample pool via on-line questionnaires, and the ease at which follow up correspondence could be sent prompting respondents to complete data collection at time-point 2. This method of data collection may result in a sample that is not entirely representative of the population from which it was drawn, further limiting generalisability. That being said, no significant differences were reported between those respondents who completed data collection at both time-points compared to those who did not. Therefore, while a portion of the sample size was lost this does not necessarily reflect a loss of variability within the sample.

While there are interview-based data collection methods available to measure some constructs (specifically the Adult Attachment Interview; George, Kaplan, & Main, 1996), and as previously discussed in Chapter 2, similar methods for internal constructs such as mindfulness are not available. As such, despite the inherent issues with self-report measures, the FFMQ framework (Baer et al., 2006) remains an appropriate way to measure the five facets of mindfulness. Nonetheless, the reliance on self-report measures is consistent with the current state of the research literature. Further to this, while participants were assured that their responses were anonymous and confidential, their responses depend on their own subjective experiences which may be skewed by a desire to give socially acceptable answers. Future research could take measures to account for this possibility, e.g. by using the Balanced Inventory of Desirable Responding (BIDR; Paulhus, 1988).

In Chapter 3, attachment orientation was measured using the ECR-R (Fraley et al., 2000) to capture avoidance and anxiety, and additionally, the ADA (Paetzold et al., 2015) to capture disorganisation. However, in the current study, disorganisation was not included. This represents a limitation, as Chapter 3 highlighted a moderate relationship between disorganisation and mindfulness. Future research should include disorganisation to correct this omission, which was caused by the temporal sequencing in which the studies were conducted.

While the current study focused on establishing the relationship and directionality between the included constructs by collecting data longitudinally, the time frame for this study was a short-medium term of 15 weeks. While this time-frame is adequate to make short-term longitudinal associations and predictions, this study may be criticised for not implementing a lengthier longitudinal data collection period. That being said, the current short-medium longitudinal period is an appropriate starting-off point and can be used to inform studies wishing to examine longer-term associations between constructs.

To further elucidate the nature of the relationship between adult attachment orientation and dispositional mindfulness, future research should seek to examine their associations across a longer time frame. This would help determine whether what is presented in this study is a snapshot within a longer-term change process or if these associations remain constant. It could be possible that attachment avoidance and other facets of mindfulness would show change and associations if researchers were to examine these constructs over a period of 6-12 months, or even longer.

The present sample size of those respondents that completed data collection at both time-points does not allow for more complex data analysis. The attrition rate within this particular study was 62% with only 84 out of 220 participants completing the measures at both time-points. It is possible to speculate that level of attrition was encountered to sampling undergraduate students and that stresses and commitments of higher education take precedence over participating in research.

# 4.5. Conclusions

In conclusion, this study reports, for the first time, the short-term longitudinal stability of the associations between adult attachment orientation and mindfulness. Additionally, to my knowledge, this is the first study to examine the stability of dispositional mindfulness. The results presented in this chapter preliminary evidence to refute the previously held view that the relationship between these constructs is bidirectional (Ryan et al., 2007). I found the contrary to be true with attachment orientation (specifically attachment anxiety) a significant predictor of two cognitive facets of mindfulness (act with awareness and non-judging), but mindfulness facets were not a predictor of adult attachment orientation. These findings suggest that attachment anxiety, and subsequent hyperactivation of the attachment system, impedes the capacity for mindfulness. If this is the case, and as both of these mindfulness facets have been shown to have negative implications on mental health outcomes, this can inform interventions to effectively improve mental health and well-being by focusing on reducing attachment anxiety.

Regarding the contextual narrative of undergraduate student psychological well-being, it is possible to conclude that, as a whole, adult attachment orientation is predictive of respondent’s reliance on maladaptive coping behaviours and their overall ability to meet the demands of the environment they find themselves in – both important aspects of successfully adapting to university life. Such results could prove instrumental in developing resources aimed at promoting undergraduate student mental health and their ability to successfully adapt to university life by looking towards methods that successfully reduce attachment insecurity or bolster attachment security. The results also support the notion that mindfulness interventions might be appropriate for student stress, because trait mindfulness was a significant predictor of later stress levels.

Having begun to establish evidence for a directional relationship between attachment orientation and mindfulness in this chapter, the following chapter builds on this by examining whether lab based manipulations designed to increase state mindfulness and state attachment security have cross-over effects on the other construct.

# Chapter 5. Examining the Causal Direction Between State Adult Attachment Security and State Mindfulness

# Abstract

 Having found evidence to suggest that the relationship between adult attachment and mindfulness is not bidirectional as previously thought, the aim of this study was to test the causality of this relationship. Employing a 3x2 (condition x time) repeated measures design, the present study compares the efficacy of a novel attachment security prime to a mindfulness induction and control exercise (*n*= 70), at increasing state mindfulness and state attachment security. Participants completed an online baseline and screening questionnaire comprised of the Experiences in Close Relationships-12 (ECR-12), Adult Disorganized Attachment (ADA), the Five Facet Mindfulness Questionnaire Short Form (FFMQ-SF), and a screening measure of a modified version of the Attachment Networks and Relationship-specific Attachment Styles measure. Eligible participants were invited to complete all 3 lab sessions (5+/- days apart). Priming attachment security was the most effective method for increasing mindfulness of the mind (relating to mental events) which was moderated by baseline measures of attachment avoidance. Priming mindfulness was most effective at increasing mindfulness of the body (relating to physical sensations). Contrary to previous research, the results presented here evidence a causal relationship between state adult attachment and state mindfulness. These findings argue the possible causal role of attachment orientation in the development of mindfulness, but that the reverse is not true.  Further, these novel findings advance greatly our understanding of the relationship between mindfulness and attachment, and have considerable implications for mindfulness practice and highlight the prospect of augmenting attachment orientation to bolster its effects or as an alternative practice.

# 5.1. Introduction

Throughout the literature, researchers have proposed a bidirectional relationship between attachment orientation and mindfulness (Ryan et al., 2007). Ryan and colleagues (2007) proposed this bidirectionality based on the core qualities of mindfulness fostering a secure attachment (characterised by low attachment anxiety and avoidance), as well as a secure attachment fostering the development of mindfulness.

In Chapter 1, the results from the meta-analysis confirmed a clear significant relationship between the two constructs, with attachment anxiety and avoidance associated with, and in some cases statistically predictive of, levels of total mindfulness. Of these two dimensions of attachment insecurity, attachment anxiety was more often negatively associated with total mindfulness than attachment avoidance. However, these findings did not speak to the directionality of their relationship.

According to attachment theory (Bowlby, 1969), attachment orientation in adulthood is often regarded a trait-like pattern of affect regulation strategies that develop as a direct result of our experiences of being cared for in close relationships. As discussed throughout this thesis, our early caregiver experiences directly influence the development of our inner working model (Bowlby, 1969, 1973) of the self, others, and personal relationships that guide the way we experience, approach, and deal with stressors or threats (Bowlby, 1982; Waters et al., 2002). Research has highlighted the influence these working models have on information processing and interpersonal functioning, most pertinently emotions, affect regulation, and behavioural strategies (see Mikulincer & Shaver, 2007; Shaver & Mikulincer, 2002 for a review).

These working models influence the way we attend to and perceive information from both internal and external sources. Those individuals exhibiting a secure attachment style are likely to hold a positive working model of themselves, others, and relationships and, as a result, develop self-trust and be trusting of others (Ryan et al., 2007). They are also easily placated and comforted when stressed, have a repertoire of effective, and adaptive, coping strategies, and are more compassionate than individuals exhibiting greater attachment insecurity (Ryan et al., 2007). According to Ryan and colleagues, it is these specific qualities that are thought to allow the individual to pay attention to external and internal stimuli, be present to both positive and negative experiences, and do so non-judgmentally, all of which are key components of mindfulness (Kabat-Zinn, 1994). As a distinct state of consciousness, mindfulness allows the noticing, rather than comparing, evaluating, or ruminating about, sensory input (Brown & Ryan, 2003). If the relationship between attachment and mindfulness was bidirectional in nature, those with higher trait mindfulness should also be protected against the negative effects of emotions and thoughts characteristic of insecure attachment (fear of rejection/abandonment or fear of intimacy; Ryan et al., 2007).

## 5.1.1. Evidence of Directionality

Alongside their suggestion of bidirectionality, Ryan and colleagues (2007) also suggested the possibility of an alternate causal pathway between attachment security and mindfulness. They posited that those who experienced sensitive and responsive caregiving in early childhood are more likely to develop a secure attachment and greater mindfulness. That is to say, attachment security and mindfulness are both “caused” by the common factor of sensitive, responsive caregiving.

However, the results reported in Chapter 4 indicate that while some aspects of attachment orientation predicted some aspects of mindfulness over time (attachment anxiety at T1 predicted act with awareness and non-judging at T2), the reverse was not true. That is to say, plainly, that attachment orientation (specifically attachment anxiety) was predictive of mindfulness but mindfulness was not predictive of either attachment dimension.

These results suggest that the hyperactivation of the attachment system, characteristic of attachment anxiety, impedes the capacity for mindfulness. As outlined in Chapter 4, those high in attachment anxiety tend to be at the mercy of their emotions, struggle to self-sooth (Mikulincer & Shaver, 2007) and hold negative self-views (Bartholomew & Horowitz, 1991). It is these very characteristics that are in opposition to acting with awareness and non-judging, which require a present-moment awareness and non-critical view of the self, internal, or external experiences. Having found evidence of a predictive relationship between attachment orientation and mindfulness, it is not without reason to posit that there could be a direct, causal relationship between the two constructs after all.

In Chapter 3, disorganised attachment was found to be associated with a diminished capacity to be mindful, further highlighting the overlap between the constructs of attachment orientation and dispositional mindfulness. Following on from these findings, the decision was made to again include disorganised attachment in the current study.

## 5.1.2. Experimental Work Attempting to Determine Causation

Some researchers have tried to establish the causal direction of the relationship between attachment orientation and mindfulness. Experimental research has produced mixed findings. Pepping, Davis, and O’Donovan (2015) conducted two studies in which they examined the effects of a mindfulness induction on state attachment security (Study 1) and priming attachment security on state mindfulness (Study 2). In study 1, participants were assigned to either a control group or one of four mindfulness induction (experimental) groups (mindfulness of breath, thoughts, emotions, and body) 15 minutes in length. In study 2, participants were assigned to a control or experimental condition in which they were given one of four possible security priming materials, 10 minutes in length. Details provided by Pepping and colleagues (2015) indicate the security priming methods were those used in previous research (Mikulincer et al., 2001; Mikulincer, Hirschberger, Nachmias, & Gillath, 2001; Mikulincer & Shaver, 2001).

Pepping and colleagues (2015) found that priming attachment security had no effect on state mindfulness, and inducing mindfulness had no effect on state attachment. Naturally, there are several issues to consider when evaluating these research studies and their results. Most notably, Pepping and colleagues (2015) relied on a between-subject design which raises issues of individual variability between participants in the two distinct samples. Considering their aim to delineate the relationship between state measures of adult attachment and mindfulness by examining the possible bidirectional association, the implementation of a between-subjects design introduces an element of individual variability – further purported by a lack of analysis to determine differences between groups. Such variability impedes the confidence with which conclusions from their results can be made regarding the direction of the association between adult attachment and mindfulness and the overall generalisability of results.

In addition, Pepping and colleagues (2015) did not control for trait differences between participants. Considering the nascent experimental literature in this area, developing a concrete understanding of the relationship between these constructs, at both the trait and state levels, is of paramount importance. As such, Pepping and colleagues’ (2015) findings provide limited contributions to understanding this relationship between in two crucial ways as conclusions cannot be made regarding: a) the relationship between trait and state measures of adult attachment and mindfulness; and, b) the association between trait measures and the efficacy of the experimental manipulations.

It should also be noted that Pepping and colleagues (2015) used a total of four priming methods per each experimental condition. The priming methods not only varied by medium of delivery but also content in each of the studies. In the first study, participants were either assigned to one of four mindfulness inductions (breath, thoughts, emotions, or body) or control exercises (reading a story about nature, or reflecting on their use of listening skills, assertion, or use of questions in conversation). In study 2, however, participants were assigned to one of four attachment security primes (exact materials not explicitly stated by the authors) or control exercises (watching a brief clip of waterfalls, or reflecting on their use of listening skills, assertion, or use of questions in conversation). Arguably, these studies by Pepping and colleagues (2015) did not compare the effects of a mindfulness induction and security prime on state measures of attachment and mindfulness but, rather, examined the effects of a combined total of 13 conditions (three of the control conditions were repeated in study 2). Considering the limited sample sizes (study 1, 86; study 2; 67), this calls into question the reliability of the results and whether their studies were adequately powered.

In a further experimental study, Melen et al. (2016) reported that priming attachment anxiety lowered state mindfulness, an effect mediated by emotion regulation capabilities. These findings are consistent with the results of Chapter 4, where, over time, attachment anxiety negatively predicted some aspects of mindfulness. Taken together, these findings suggest how attachment insecurity might hamper mindfulness, but many questions remain unanswered regarding the causal link between attachment security and mindfulness. Considering the individual development and implementation of both attachment systems and mindfulness, it is important to examine this more closely, using a rigorous, tightly controlled experimental paradigm.

Assessing the effects of long-term interventions, designed to boost trait attachment security on the one hand and trait mindfulness on the other, on both of these outcomes, would be beneficial for detecting a genuine causal relationship between these constructs. Doing so would also be an important first step in understanding how mindfulness develops. However, such a large undertaking is beyond the scope of the present thesis, and an important first step is to establish whether these effects occur in the short term using lab-based manipulations.

## 5.1.3. Differences Between Trait and State Measures

Personality research has traditionally distinguished between trait and state measurements of a number of constructs (e.g., Endler & Kocovaski, 2001; Endler & Parker, 1990). Research has demonstrated the recurrent activation of a state construct can ultimately lead to a change in its trait form and individual differences in rates of learning and change (e.g., Rogosa & Willett, 1985). It is reasonable to think that recalling or imagining certain life events and experiences can temporarily affect different constructs at a state level. These temporary fluctuations are not just fleeting changes, but result in meaningful behaviour and behavioural change. Traits, however, are not as amenable to change and remain relatively stable over time (indeed, we saw short term evidence of this in Chapter 4). In the current study, I measure both trait and state adult attachment and mindfulness. Trait measures are used for the purpose of co-varying out baseline individual differences from the analysis.

## 5.1.4. State Adult Attachment and Measurement

Throughout the attachment theory literature, attachment orientations are conceptualised as stable dimensions of personality (Waters et al., 2000). While this has been repeatedly documented, more recent conceptualisations (e.g., Gillath, Hart, Noftle, & Stockdale, 2009) suggest that attachment orientations are more complex than a stable disposition. The use of the term working modelthroughout the literature suggests this possibility. Outlined in Bowlby’s (1969, 1982) theory of attachment, the mental representations of ourselves and others develop in response to our experiences – this is especially true in the context of close relationships. These mental representations are said to be revised and updated as an individual experiences new relationships that provide consistent (perhaps different) information about the self and others. Bowlby (1969) did, however, propose that the working models formed in early life will persist into later life/adulthood.

Research has supported Bowlby’s theory of working models and a more dynamic attachment system. Kirkpatrick and Hazan (1994) found relationship experiences moderate the stability of attachment orientation in a sample of undergraduate students over a period of 4 years. In their findings, they reported that the dissolution of relationships was associated with changes from secure to insecure attachment styles, and those individuals classified as avoidant who formed new relationships were less likely to remain avoidant than those who did not. Similarly, Davila and Sargent (2003) reported that perceptions of greater interpersonal loss were positively associated with greater attachment insecurity day-to-day. Notably, they reported that trait levels of attachment security did not moderate this association, thus suggesting that state attachment is independent from dispositional attachment orientations. That being said, Davila and Sargent (2003) also reported high week-to-week correlations between attachment scores, meaning that they may not have actually captured the state component of attachment which, ultimately, led Gillath et al. (2009) to develop the State Adult Attachment Measure (SAAM) used in the present study.

Changes in attachment orientation at the state level are thought to be possible as individuals simultaneously hold multiple models of themselves and others that are ordered in a hierarchical fashion (Baldwin, Keelan, Fehr, Enns, & Koh-Ragarajoo, 1996; Collins & Read, 1994; Pierce & Lydon, 2001). Each of these models is susceptible to activation and can made more available at any time. To that end, levels of attachment anxiety, avoidance, and security become a function of the schema that is most strongly activated (Gillath et al., 2009).

Within the attachment literature, research has provided evidence for the malleability of inner working models, and, accordingly, attachment orientations, across short durations of hours and even minutes (Baldwin et al., 1993; Baldwin et al.,1996). Considering this research, it is clear that experiences, life events, and even experimental activation of close relationship schemas (most notably the secure base schema) temporarily affects attachment security and insecurity (Gillath et al., 2009). Gillath and colleagues (2009) proposed that these fluctuations result in meaningful changes and should be measured as such.

Up until the development of the State Adult Attachment Measure (SAAM; Gillath et al., 2009) there was no way to measure these fluctuations in adult attachment. While the ECR (and its variations) is a highly reliable and valid instrument, it was explicitly designed to measure trait attachment. This is reflected in the wording of its items which direct individuals to reflect on their general experiences in relationships, which may result in the activation of general, abstracted attachment models at the expense of time-sensitive, momentary models (Gillath et al., 2009). As such, the SAAM successfully measures the fluctuations in attachment security and insecurity in response to situational variables. Gillath and colleagues (2009) reported momentary changes across three dimensions of attachment (security, anxiety, and avoidance). Therefore, unlike the ECR/ECR-R measure of adult attachment, measuring state attachment captures and differentiates between three unique psychological processes: anxiety about attachment, avoidance of attachment, and *security-based strategies* (Gillath et al., 2009; Mikulincer & Shaver, 2003).

The measurement of security based strategies goes beyond low attachment anxiety and avoidance. Similar to other mood states or emotions, these dimensions are relatively independent and display unique patterns of associations with proximity seeking and distancing behaviours (Elliot & Reis, 2003). Gillath and colleagues (2009) reasoned that, because of these associations, scoring low on the anxiety and/or avoidance SAAM subscales does not necessarily translate to scoring high on security.

## 5.1.5. Priming Attachment Orientations

Research has documented further evidence supporting the theory that working models, and subsequently attachment orientation, are malleable across even short durations – including minutes or hours. Even the process of remembering times when we have felt secure, anxious, or avoidant has been shown to momentarily activate that specific attachment schema (Baldwin, Fehr, Keedian, Seidel, & Thomson, 1993; Baldwin et al., 1996). Akin to other cognitive networks, attachment schemas and their associated behaviours are automatically, temporarily activated in relevant situations. This temporary activation is thought to override stable, dispositional attachment orientations and has been reported to influence individual’s perceptions and behaviours, at least for a short time (e.g., Gillath et al., 2006; Gillath et al., 2008).

While some changes can be fleeting, others have been documented as lasting much longer. There is a large literature on both the short- and long- term benefits of priming attachment security (see Gillath et al., 2008 for review). Throughout the literature, studies have detailed the salutary effects of experimentally activating one’s secure close relationship schemas (priming). Priming studies have documented that enhancing attachment security or insecurity produces a range of style-congruent behaviours (for reviews see Gillath et al., 2008; Mikulincer & Shaver, 2007). While our attachment style is amenable to change in relation to brief moments and situations, this is only within a range determined by our stable, dispositional attachment orientation (Gillath et al., 2009).

In the past, researchers have primed attachment insecurity, which has produced primed-style-congruent responses in domains such as information processing (Rowe & Carnelley, 2003). In Chapter 4, I found that attachment anxiety negatively predicted some aspects of mindfulness over time. A logical next step here may be to prime attachment anxiety, to see whether consistent reductions in state mindfulness occur. However, this is not the design employed in the present study. This decision was taken for ethical, impact, and research design reasons. A growing body of evidence suggests that priming attachment security is potentially quite powerful (e.g., Carnelley & Rowe, 2010), not to mention socially (e.g., Boag & Carnelley, 2016) and clinically (McGuire, Gillath, Jackson, & Ingram, 2018) useful. The widespread positive effects of priming security (Gillath & Karantzas, 2019) combined with the dearth of research into how long priming effects last may begin to call in to question the ethical wisdom of priming insecurity. Additionally, security priming has also been shown to reduce attachment anxiety (Carnelley & Rowe, 2007), and for this research to be maximally useful in future intervention development, it should focus on enhancing security, rather than enhancing insecurity. Regarding research design, it is important to note that mindfulness inductions are usually experienced in a positive manner, thus the attachment prime to which it will be compared in this study ought to match this valence.

For the reasons outlined above, this study will compare the effects of priming attachment security, and inducing mindfulness, against a control condition.

### 5.1.5.1. Priming Attachment Security

In the relevant literature, attachment security is operationally defined by low scores on both dimensions of attachment insecurity: attachment anxiety (characterised by a fear of unlovability and rejection, a strong and intense need for love, approval, and proximity seeking) and attachment avoidance (characterised by a discomfort with closeness and interdependence, distrust of relationship partners, and a preference for emotional distance and self-reliance).

While a plethora of studies have documented the associations between attachment insecurity and maladaptive functioning and mental and physical health (e.g., Mikulincer & Shaver, 2002, 2007), there is a wealth of literature detailing the positive benefits of priming attachment security. Security priming can be delivered using various methodologies. For example, the current literature documents security priming by such methods as subliminally presenting the names of an individual-specific security-enhancing relationship partner, inducing guided imagery about past supportive social interaction, presenting pictures to evoke a sense of affection; Shaver et al., 2007).

These instances of inducing felt security have been shown to increase positive affect and reduce emotional responses to stress and trauma and defensive self-enhancement (Arndt, Schimel, Greenberg, & Pyszczynski, 2002; Mikulincer & Shaver, 2007; Schimel, Arndt, Pyszczynski, & Greenberg, 2001). Arndt and Schimel (2003) concluded that even the act of thinking about one’s security-enhancing attachment figures “promotes a more secure feeling of self-esteem that is less vulnerable and this less in need of psychological maneuvers to sustain it” (p. 29).

### 5.1.5.2. The Secure Base Schema

According to Bowlby (1973), positive interactions with available and supportive caregivers in times of stress are internalised into inner working models of attachment security and facilitate a sense of felt security (Sroufe & Waters, 1977). This has been described as the set of expectations we hold about others’ availability and responsiveness in times of stress that are organised around a basic prototype or ‘secure base schema’ (Water, Rodrigues, & Ridgeway, 1998). Attachment research has consistently found that secure base representations (manifested in relationship-specific and global expectations of security) are positively associated with positive models of the self and others, psychological well-being, and affect regulation (see Mikulincer & Florian, 1998; Shaver & Hazan, 1993 for review).

While the sense of having a secure base may be global and relatively stable, reflecting one’s history of interactions with attachment figures, meaningful interactions with a specific partner may influence and shape previous beliefs held about others’ availability and supportiveness (either positively or negatively; e.g., Baldwin et al., 1996; Mikulincer & Arad, 1999). This sense of a secure base can be contextually activated by actual or imagined encounters with available and supportive others (e.g., Baldwin, 1992; Mikulincer et al., 2000). It is possible for individuals to develop a relationship-specific secure base organised around experiences with a specific partner, even if this relationship-specific schema does not fit with a general, chronic sense of not having a secure base (Collins & Read, 1994).

In a series of experimental studies, Mikulincer and colleagues (2001) detailed the effects of security priming in relation to the secure base schema. Overall, they found that subliminal priming of a secure base led to increased positive affect when compared with priming neutral or no pictures. Further to this, they found similar effects when using verbal or pictorial variations representing the secure base schema, which supports the idea that positive affect is part of the secure base schema (Mikulincer et al., 2001).

### 5.1.5.3. The Affective Component of the Secure Base Schema

The secure base schema can be thought of as a representation of the self, others, and the relationship interactions. This secure base schema is activated when individuals achieve the goal of the attachment system (i.e. proximity maintenance in times of stress) and also when discrepancies have been reduced (e.g., regaining proximity following separation), which may result in positive affect (Mikulincer et al., 2001). The representation of others includes positive affective connotations (i.e., good, loving, warm) which is an integral part of the representation of the shared interaction pattern (i.e., proximity seeking/maintenance results in relief). These experiences of distress alleviate following proximity seeking to a supportive other that induces anticipated affect (Mikulincer et al., 2001).

Regarding priming attachment security, even the perception of attachment-figure availability is enough to reduce distress and maintain or restore positive mood (Mikulincer & Shaver, 2007). When attachment security is primed it results in the temporal activation of mental representation of attachment figures and can make these figures available, albeit symbolically, augmenting an individual’s sense of felt security, and, ultimately, maintaining an individual’s adaptability even under stressful conditions (Mikulincer & Shaver, 2007). Various well-validated techniques to experimentally activate mental representations of supportive attachment figures and, therefore, attachment security have been used (e.g., Mikulincer et al., 2001; Mikulincer & Shaver, 2001). These methods of security priming include subliminal techniques (exposing participants to words or pictures related to secure attachment figures (see Mikulincer & Shaver, 2007 for review); supraliminal techniques (including asking participants to visualise or write about memories associated with a secure attachment figure (see Baldwin et al., 1996). In the current study, I seek to examine the effects of priming attachment security on state attachment orientation, state mindfulness, and HE retention. Specifically, I will examine whether priming attachment security leads to an increase in state security and state mindfulness, and a reduction in intent to drop out of university.

## 5.1.5.4. Novel Security Prime Development

As mentioned, previous research has employed various methods of priming (subliminal display of words or pictures, writing tasks, and brief recall tasks [see review by Mikulincer & Shaver, 2007]) yet there are no published works detailing auditory based priming stimuli designed to engage individuals to actively imagine a close attachment figure for an extended period of time. This is a notable gap, important to the current study because in order to compare a security prime to a mindfulness induction, it was necessary to develop a longer security prime, in the same modality as to ensure they are adequately matched. Further to this, considering the benefits of priming attachment security and addressing accessibility issues of the aforementioned methods, developing a prime that would translate more readily available outside of a laboratory setting is overdue.

## 5.1.6. State Mindfulness and Measurement

The majority of work in the available literature has focused on the measurement of mindfulness as a trait-like construct or, as mentioned throughout this thesis, a disposition (e.g., Five Facet Mindfulness Questionnaire [FFMQ], Baer et al., 2008). While the measurement of mindfulness as a trait is indeed important, it is not specifically designed to capture and reflect mindfulness as a mental process which is state-like in nature, context-dependent, and, most importantly, variable (Bishop et al., 2004; Sauer et al., 2013). Bishop and colleagues (2004), in their definition of mindfulness, were explicit in their conceptualisation of the construct and that, to them, it was more state-like in nature: “We see it [mindfulness] as much closer to a state than a trait” (p. 234).

To that end, it is imperative that researchers and clinicians have access to measures that adequately and reliably capture the fluctuations in the state-like aspects of mindfulness. In the current mindfulness research literature there are three self-report scales measuring state mindfulness (State-Mindful Attention and Awareness Scale [MAAS], Brown & Ryan, 2003; Toronto Mindfulness Scale [TMS], Lau et al., 2006; State Mindfulness Scale [SMS], Tanay & Bernstein, 2013). The State-MAAS was designed to measure one’s recent or current expression of mindful attention and/or awareness of daily activities. Despite its popularity, this measure is limited as it was not designed as a measure of mindfulness in all contexts, but specifically for daily activities. Additionally, while the state-MAAS does measure the mindful awareness and/or attention of one’s engagement in daily activities, it does not capture this attention to the physical and mental qualities of one’s experience (such as being aware of passing thoughts and emotions) – a central tendency to mindfulness practice. As such, this measure does not provide us with a comprehensive reflection of the construct of state mindfulness and, arguably, exhibits a lack of content validity. The TMS (Lau et al., 2006) is a self-report measure of state mindfulness that is made up of two separate factors – *curiosity* and *decentring*. One of the main criticisms of this measure is the inclusion of the decentring which is regarded as an outcome of mindfulness rather than a core aspect of the construct (Fresco, Segal, Buis, & Kennedy, 2007). Similarly, to the State-MAAS, the TMS arguably lacks content validity as it limiting its focus to curiosity rather than reflecting the construct as a whole (Bishop et al., 2004). Further, the TMS reflects curiosity about and decentring towards thoughts and emotions, neglecting physical aspects of experience that can also be attended to mindfully (Kabat-Zinn, 1990).

The third, and chosen measure of state mindfulness for the current study is the SMS (Tanay & Bernstein, 2013). This self-report measure is divided into two distinct dimensions of mindfulness and mindfulness practice; *state mindfulness of mind* and *state mindfulness of body*. These two dimensions successfully distinguish between the objects of mindful attachment – physical sensations and mental events (such as emotions and thoughts). As one of the main aims of this chapter was to establish the causal direction between adult attachment and mindfulness, a comprehensive and all-encompassing measure of state mindfulness was chosen. It is hoped that choosing such a measure will provide us with novel insight and nuances into the effects of the experimental manipulations on state mindfulness and provide us with a more comprehensive picture of its relationship with adult attachment.

## 5.1.7. Inducing Mindfulness

Research into mindfulness inductions has documented a host of positive outcomes in several important domains, including mental health, physical health, behaviour regulation, and interpersonal functioning and relationships (see Brown et al., 2007 for review). While the literature is rich with investigations into the benefits of mindfulness having utilised induction and intervention methodologies (e.g., Creswell, 2017; Keng et al., 2011), the method of focus throughout this chapter will be a single, lab-based mindfulness induction. This method of mindfulness practice delivery has previously been employed to examine the effects of mindfulness on affect and behaviour regulation and aspects of cognitive performance (Brown et al., 2007).

Mindfulness inductions guide participants through a set of specific instructions designed to bring attention to, and deepen one’s awareness of moment-to-moment experiences (physical, emotional, and cognitive). They are designed to guide individuals to achieve an observant stance toward experiences, so that present moment realities can be viewed from a decentred and non-judgmental way and also in a non-reactive manner. Individuals are encouraged to have an attitude of acceptance of events and experiences. This acceptance is thought to facilitate the capacity to sustain attention to current experience, particularly when it is cognitively and/or emotionally engaging or challenging (Brown et al., 2007). Another core facet of mindfulness practice, and prompted by aforementioned inductions, is the facilitation of sustained, non-discriminatory observations of our moment-to-moment experiences.

Some of the more popular mindful awareness practices are a guided breathing meditation (in which individuals use their breath as an object of concentration) and the body scan exercise (cognitive relaxation technique that requires individuals to shift the focus of their attention to different parts of their body). The results of a recent meta-analysis (Schumer, Lindsay, & Creswell, 2018) showed that brief mindfulness training has an immediate and significant effect on decreasing negative affectivity in both clinical and non-clinical samples. It was also reported that the length of mindfulness interventions (ranging from one session to two weeks of mindfulness training) did not moderate the overall effect but brief, one-off mindfulness inductions (ranging from 8 to 45 minutes) produced comparable effects to longer, multi-day interventions (Schumer et al., 2018). In the present study, I seek to examine the effects of a one-off, brief mindfulness induction on state mindfulness, state attachment orientation, and HE retention. Specifically, whether mindfulness practice increases state mindfulness and state attachment security, and reduces the intent to drop out of university.

## 5.1.8. The Current Study

The present study aims to address the absence of rigorous experimental studies examining the causal relationship between these two constructs as well as the main issues with the studies presented by Pepping et al. (2015). First, a repeated measures design was employed. By manipulating each construct in the lab and looking for change in the other, this was the first study to directly compare the efficacy of an attachment security prime and mindfulness induction exercise on state measures of attachment security and mindfulness. Here, the limitation of individual variance across conditions has been eliminated.

Secondly, the present study has assigned one exercise per condition. This provides consistency lacking in previous research in regard to the content of the material participants are exposed to and the data from which inferences are made. In addition, the valence of materials across the conditions is closely matched, which will allow for direct comparisons of efficacy to be made. Here, we reassess the associations between state attachment and mindfulness using a higher powered sample.

Lastly, we include baseline measures of both traits and, accordingly, examine the influence of adult attachment orientation and mindfulness of the efficacy of a mindfulness induction and priming attachment security. As such, more nuanced inferences can be made regarding the nature, direction, and causality of the relationship between adult attachment and mindfulness.

Previous research has found priming attachment security results in higher felt security and, although the present study is measuring state attachment security, similar results are expected. Carnelley and Rowe (2007) found that repeatedly priming attachment security significantly reduced attachment anxiety, so a similar effect here is expected on state attachment anxiety. No predictions have been made for state attachment avoidance as previous research has not identified any effect of priming attachment security on avoidance.

*H1: Priming attachment security will significantly increase state attachment security, and reduce state attachment anxiety.*

The benefits of mindfulness practice are well documented (e.g., Carmody & Baer, 2008). Traditionally, mindfulness-based stress reduction (MBSR) and mindfulness-based cognitive therapy (MBCT) require multiple sessions and span a number of weeks. However, research has also documented the effects of brief, one-off mindfulness inductions on state mindfulness (e.g., Pepping et al., 2015).

*H2: Inducing mindfulness will significantly increase state mindfulness of the mind and of the body.*

The results presented in Chapter 4 presented the longitudinal relationship between attachment orientation and mindfulness. Specifically, attachment anxiety was predictive of some facets of mindfulness over time. Therefore, it is not without reason to predict that priming attachment security will reduce state attachment anxiety and lead to an increase of mindfulness. However, as this appears to be the first study of its kind, these predictions are tentative.

*H3: Priming attachment security will significantly increase state mindfulness of the mind and of the body.*

As presented in Chapter 4, the relationship between adult attachment orientation and mindfulness is not bidirectional. Therefore, it is logical to hypothesise that priming security will lead to an increase in state mindfulness and inducing mindfulness will not have an effect on state attachment security. Again, this is a tentative hypothesis based on previous findings. While no specific hypotheses have been formulated for the effects of inducing mindfulness on state anxiety or avoidance, they will be assessed for completeness

*H4: Inducing mindfulness will not significantly increase state attachment security.*

Both attachment security and mindfulness have been associated with positive well-being and mental health (e.g., Ryan et al., 2007; Shaver et al., 2007). Their importance has also been highlighted in the context of HE. Research has reported the associations between attachment security and adaptive functioning among undergraduate students (Lopez et al., 2002) as well as the benefits of mindfulness and mindfulness practice for coping with the demands of university life (e.g., Lynch et al., 2010). As there is a growing literature documenting the benefits of priming attachment security and mindfulness practice, it is not without reason to expect immediate changes in a construct that can be considered a coping strategy.

*H5: Both experimental conditions (security priming and mindfulness induction) will significantly reduce intent to drop out of university. However, as this is the first study of its kind, no predictions were made for which manipulation will be most effective.*

# 5.2. Method

## 5.2.1. Design

A 3x2 (condition x time) repeated measures design was used to test the efficacy of an attachment security prime, mindfulness induction, and a control condition on state measures of adult attachment orientation and mindfulness. Undergraduate students were recruited to complete an online baseline questionnaire assessing dispositional adult attachment and mindfulness and included a screening measure to assess participant eligibility.

*Inclusion Criteria.* Participants had to be currently enrolled as an undergraduate student and report having at least one secure attachment figure (see screening questionnaire below). A total of 30 (out of 153) participants (19.61%) were excluded from the present study based on this criterion determined by an adapted version of an attachment networks and relationship-specific attachment styles used by Rowe and Carnelley (2003) included in the baseline questionnaire. Participants were required to complete each of the 3 lab sessions, on average, 7 days apart. A minimum of 5 and maximum of 9 days was imposed to reduce the likelihood of carry over effects between sessions. Participants who were unable to schedule participation within these limits were excluded from the study (*n* = 2).

*Randomisation Process.* All participants were randomly allocated to 1 of 6 testing orders for the sequence in which they completed the sessions as a method of counterbalancing. In each lab session, participants completed pre and post measures, the order of which was randomised.

## 5.2.2. Participants

Undergraduate students were recruited for course credit or monetary compensation, using Sona Systems subject pool software, and a university-wide email distribution list, respectively. While only undergraduate students were permitted to take part in the study, the lower age limit was 18 years old while no upper age limit was imposed. The sample size (*N* > 64) was determined using a-priori power analysis using G\*Power (Faul et al., 2009) to run ANCOVA’s (Cohen’s *f* effect size = 0.40, power 0.08, α = 0.05). After all incomplete, duplicate, and non-qualifying entries were removed, a sample size of 117 were invited to take part in the lab sessions. Out of the 72 participants who signed up for the remainder of the study, only two participants did not complete all experimental sessions (see Fig. 1). These participants were removed before analysis. The final sample was made up of 70 undergraduate students (81.4% female, 80% British). The age range was 18-56 years (*M* = 21.26; *SD* = 7.55) the majority were first year students (82.9%) and a many of the participants were studying psychology (72.9%). See Supplementary Table 5.1 for additional sample demographic characteristics and Supplementary Table 5.2 for participant flow diagram.

## 5.2.3. Measures

### 5.2.3.1. Baseline Measures

#### *5.2.3.1.1. Adult Attachment*

Adult attachment was assessed using three measures, a modified version of the Attachment Networks and Relationship-specific Attachment Styles measure (see Rowe & Carnelley, 2003), the Experiences in Close Relationships-12 scale (ECR-12; Lafontaine et al., 2015), and the Adult Disorganized Attachment scale (ADA; Paetzold et al., 2015).

The Attachment Networks and Relationship-specific Attachment styles measure was used as a screening measure to determine whether participants had at least one secure attachment figure in their lives. Participants were presented with four descriptions representing different attachment prototypes (see Hazan & Shaver, 1987) and asked to rate whether there was a close significant other in their life that matched each description (yes or no) and how representative each prototype was of how they feel in that relationship using a Likert-scale ranging from 1 (*Not very representative*) to 5 (*Very representative*). Participants who indicated having a secure attachment figure with a representative score of 3 and above were eligible to take part in the study.

The ECR-12 (Lafontaine et al., 2015) is a self-report assessment of adult attachment derived from the original 36-item ECR (Brennan et al., 1998). The scale’s 12 items are divided into two 6-item subscales that represent the two underlying dimensions of adult attachment: attachment anxiety (e.g. “I worry about being abandoned”) and attachment avoidance (e.g. “I feel comfortable depending on others”). Participants were asked to rate their feelings using a Likert scale ranging from 1 (*Disagree strongly*) to 7 (*Agree strongly*), with higher scores reflecting a greater endorsement of that construct. Test-retest reliability for this version of the ECR has been reported .78 for anxiety and between .74 and .83 for avoidance (Lafontaine et al., 2015). Reliability coefficients for the current study were good with Cronbach’s α of .86 for attachment anxiety and .86 for attachment avoidance.

The ADA (Paetzold et al., 2015), as described in full in Chapter 3, is a 9-item self-report measure used to assess the level of adult disorganised attachment. The Cronbach’s α for the current sample was .86.

#### *5.2.3.1.2. Mindfulness*

Dispositional mindfulness was assessed using the Five Facet Mindfulness Questionnaire, short form as described in full in Chapter 3 (FFMQ-SF; Bohlmeijer et al., 2011). The Cronbach’s α for the current sample were as follows for the mindfulness subscales: act with awareness (.77), observing (.76), describing (.82), non-judging (.82), and non-reacting (.79).

### 5.2.3.2. Pre/Post Induction Measures

#### *5.2.3.2.1. State Adult Attachment*

State adult attachment was measured using an adapted version of the State Adult Attachment Measure (SAAM; Gillath et al., 2009). The SAAM was developed to measure individual differences of temporary fluctuations in the sense of attachment. It contains three dimensions measuring state levels of attachment anxiety (e.g., “I really need to feel loved right now”), avoidance (e.g., “I’m afraid someone will want to get too close to me”), and security (e.g., “I feel secure and close to others”). Respondents were asked to rate each item from 1 (*Strongly disagree*) to 7 (*Strongly agree*), using a visual analogue scale (VAS) measuring up to 2 decimal places. It was decided to score responses using VAS to improve variance and reduce demand characteristics in a repeated measures design. Originally a 21-item self-report measure, for the purpose of the present study only the top 3 loading items from each dimension were included (see Millings et al., 2019). The Cronbach’s α coefficients for state security, anxiety, and avoidance for the current sample were .81, .73, and .84, respectively (comparable to those reported by Millings et al. [2019]).

#### *5.2.3.2.2. State Mindfulness*

State mindfulness was measured using the State Mindfulness Scale (SMS; Tanay & Bernstein, 2013). It is comprised of two dimensions measuring mindful awareness of mental events (e.g., “I noticed emotions come and go”) and mindful awareness of bodily sensations (e.g., “I clearly felt what was going on in my body”). Respondents were asked to rate each item on a scale from 1 (*Not at all*) to 5 (*Very much*) using a VAS measuring up to 2 decimal places for the same reasons given above. Again, the top 3 loading items for each dimension were used in the present study. The SMS has exhibited good psychometric properties and is an appropriate and valid measure of state mindfulness (Tanay & Bernstein, 2013). The Cronbach’s α coefficients for the shortened mindfulness of mind and body dimensions for the current sample were .83 and .85, respectively.

### *5.2.3.2.3. University Dropout*

Intentions to persist in, versus drop out of, university were assessed implementing the same method as described in full in Chapter 3. For the purpose of this study, questions were answered using a VAS measuring up to 2 decimal places for the same reasons given above. The Cronbach’s α for the current sample was .90.

## 5.2.4. Procedure

Participants completed an online battery of baseline measures of adult attachment dispositional mindfulness via Qualtrics at least one week before their first testing session. Eligible participants (determined by undergraduate status and identifying a minimum of one secure attachment figure) were then recruit to complete the rest of the study, a series of 20-minute lab sessions. Participants were required to schedule their participation, with the sessions scheduled, on average, one week apart (with a minimum of 5 days and maximum of 9 days between each session) to reduce the possibility of demand characteristics.

Session order (attachment security prime, mindfulness induction, and control condition) was fully counterbalanced, and participants were randomly assigned to one of six possible order combinations. On arrival to each session, participants completed the pre-manipulation questionnaire that assessed state attachment, state mindfulness, and intent to drop out of university, then completed the experimental manipulation, and finally completed the post-manipulation questionnaire that assessed state attachment, state mindfulness, and drop out intent. The order in which participants were presented with each measure in the pre and post manipulation questionnaires was randomised. Participants completed a funnelled debrief upon completion of their participation to evaluate awareness and suspicion of the study design and aims. Answers were rated for suspicion about: (i) the experimental manipulation; (ii) the dependent variables of interest; and (iii) the pre/post design of the study, independently, by two researchers. Inter-rater agreement was 100%. No additional participants were removed from analysis on the basis of the ratings.

## 5.2.5. Experimental Conditions

All three recordings described below were voiced by the same reader, and lasted between 9 minutes and 23 seconds, and 9 minutes and 31 seconds.

### 5.2.5.1. Attachment Security Prime

This security prime was developed for the purpose of this study due to the absence of audio security primes. Previous research has employed supraliminal stimuli, writing tasks, and brief recall tasks to prime attachment security (see review by Mikulincer & Shaver, 2007). The attachment security prime was a guided visualisation that asked participants to visualise a close attachment figure, the relationship they share with them, and to visualise this individual in a situation of dealing with life’s difficulties (see Appendix 4).

### 5.2.5.2. Mindfulness Induction

Participants were asked to follow along a brief mindfulness meditation exercise focusing on breath and thoughts. Participants were instructed to focus on the physical sensations of breathing and an acceptance of their thoughts. The recorded instructions for this exercise were adapted from the mindfulness meditation exercise used by Segal, Williams, and Teasdale (2002) in Mindfulness Based Cognitive Therapy (see Appendix 5).

### 5.2.5.3. Control Condition

In the neutral priming/control condition participants were asked to follow a guided imagination exercise of a woodland walk (May, Andrade, Batey, Berry, & Kavanagh, 2010). The recording asked participants to notice and visualise different aspects of nature in their imagined surroundings (including trees and animals; see Appendix 6).

## 5.2.6. Statistical Analysis

All but two dimensions measured by the baseline self-report measures were normally distributed. The Shapiro-Wilk Test indicated inequality of variance (*p*’s < .05) for attachment avoidance (ECR-12; *W* = .95, *p* = .012) and disorganised attachment (ADA; *W* = .96, *p* = .013). As discussed previously in Chapter 3, in relation to the distribution of adult disorganised attachment, this appears to be consistent with our theoretical understanding of this construct. Attachment disorganisation is a dimension thought to co-exist alongside attachment anxiety and avoidance rather than as an independent attachment orientation as is the case in infancy (see Main & Solomon, 1990). This is reflected in the deviation from normality reported in the current sample which highlights the polarising nature of this maladaptive categorisation and its interaction with high attachment anxiety and avoidance. For this reason, this scale was included in further analysis as-is. The deviation from normality of dispositional attachment avoidance is interesting, suggesting there is a difference in variance of this dimension of attachment. However, analysis of covariance (ANCOVA) models are quite robust to violations of normality and the assumption of normality can be violated to a degree and still provide valid results (Ali & Sharma, 1996). Currently, no alternative, non-parametric tests are available that would enable as detailed an analysis of the efficacy of experimental manipulations whilst controlling for dispositional attachment.

In order to examine whether completers of the baseline measures who completed the experimental portion of the study different to those who did not, a series of independent *t*-tests were conducted for those constructs measured at baseline (attachment orientation and mindfulness). To identify which of the dispositional variables were to be included as covariates in the main analysis (described below), bivariate correlations were conducted between attachment anxiety and avoidance (ECR-12), disorganised attachment (ADA), and the five facets of mindfulness (FFMQ-SF). In order to check that the manipulations performed as expected, paired samples *t*-tests were conducted to assess the changes in state attachment and state mindfulness following their respective manipulation.

To test the hypotheses outlined in 5.1.8., a series of 3 (condition; security prime, mindfulness induction, control) x 2 (time; pre, post) ANCOVAs with the determined covariates were conducted to assess the changes in state measures of attachment (security, anxiety, and avoidance) and mindfulness (mind and body) and also intent to drop out of university. Significant interaction effects were followed up with Pearson correlations.

The Alpha level was set to *p* < .05 for all analyses, and the Greenhouse Geisser correction was applied in situations where Sphericity was violated (Mauchley’s test, *p* > .05).

# 5.3. Results

Sensitivity power analysis conducted using G\*Power (Faul et al., 2009) (with power 0.80 and α = 0.05) yielded an effect size of Cohen’s *f* = 0.37, indicating that the minimal detectable effect was of a medium effect size – comparable to those reported by Pepping and colleagues (2015).

Descriptive statistics and a correlation matrix for the measures of adult attachment and mindfulness at baseline are reported in Table 5.1.

No significant differences were reported between those participants who completed the lab sessions and those that did not for any dimensions of the included dispositional, baseline measures (ECR-12, ADA, and FFMQ-SF).

Prior to the main analysis, repeated-measures ANOVAs were conducted to examine the effects of session order. For each of the measures (SAAM and SMS), no significant session order effects were reported (all *p* values > .05). These findings indicate that counterbalancing was successful.

## 5.3.1. Manipulation Checks

To ensure that the experimental manipulations successfully manipulated their respective target variables, paired samples *t*-tests were conducted to assess the change in SAAM security following the security priming condition and SMS mind and body following the mindfulness induction.

For state attachment security, there was a significant increase in SAAM security scores from pre (*M* = 5.15, *SD* = 1.30) to post (*M* = 5.81, *SD* = 1.18), *t*(69) = -5.43, *p* < .001, in the attachment security priming condition.

For state mindfulness, there was a significant increase in SMS of mind from pre (*M* = 7.97, *SD* = 3.03) to post (*M* = 9.23, *SD* = 3.19), *t*(69) = -3.07, *p* = .003, and SMS of body from pre (*M* = 7.56, *SD* = 2.84) to post (*M* = 11.47, *SD* =2.56), *t*(69) = -10.43, *p* < .001, in the mindfulness induction condition.

## Table 5.1 – *Descriptive statistics and correlation matrix of baseline measures of trait attachment and mindfulness (n =* 70*).*

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|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | M | SD |  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Attachment dimensions | Anxiety | 4.36 | 1.33 | 1 | - | .16 | .40\*\* | -.44\*\* | -.24\* | .21 | -.28\* | -.49\*\* | -.42\*\* |
| Avoidance | 3.25 | 1.29 | 2 | - | - | .55\*\* | -.28\* | -.27\* | .22 | -.33\*\* | -.21 | -.20 |
|  | Disorganised | 25.66 | 10.49 | 3 | - | - | - | -.18 | -.22 | .40\*\* | -.15 | -.31\*\* | -.19 |
| Mindfulness | Total | 73.89 | 10.35 | 4 | - | - | - | - | .62\*\* | .22 | .68\*\* | .68\*\* | .65\*\* |
|  | Act with awareness | 15.56 | 3.37 | 5 | - | - | - | - | - | -.16 | .28\* | .37\*\* | .32\*\* |
|  | Observe | 13.57 | 3.42 | 6 | - | - | - | - | - | - | -.02 | -.11 | -.05 |
|  | Describe | 16.30 | 3.76 | 7 | - | - | - | - | - | - | - | .36\*\* | .29\*\* |
|  | Non-judging | 14.74 | 3.81 | 8 | - | - | - | - | - | - | - | - | .28\*\* |
|  | Non-reacting | 13.71 | 3.64 | 9 | - | - | - | - | - | - | - | - | - |

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

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## 5.3.2. Efficacy of Experimental Manipulations

In order to control for any effects of dispositional attachment orientation, attachment anxiety, avoidance, and disorganisation were included as covariates in our analysis of changes in state measure from pre- to post- manipulation, between conditions. Co-variates were determined from preliminary bivariate correlations between baseline measures and change scores of state measures in each condition. A series of 3 (condition; security prime, mindfulness induction, control) x 2 (time; pre, post) ANCOVAs with the outlined covariates were conducted (covariate scores were appropriately mean centred prior to analysis).

### 5.3.2.1. *SAAM Security*

For state attachment security, there was no significant main effect of condition, but there was a significant main effect of time (*F*(1, 66) = 37.92, *p* < .001, ηp2 = .37), indicating a significant increase between pre- (*M* = 5.19, 95% CI [4.97, 5.42]) and post-(*M* = 5.57, 95% [5.35, 5.79]) test. The results also revealed a significant interaction between time and dispositional attachment avoidance (ECR-12) (*F*(1, 66) = 7.45, *p* = .008,ηp2 = .10),and a significant interaction between condition and time (*F*(2, 132) = 7.96, *p* = .001, ηp2 = .11). Post-hoc analysis (with a Bonferroni adjustment) revealed state attachment security increased significantly following each experimental condition although mean change scores were significantly higher following the security prime condition (*M* = 0.66, 95% CI [0.42, 0.90]) when compared with the mindfulness induction (*M* =0.21, 95% CI [0.53, 0.68], *p* < .001) and control (*M* = 0.26, 95% CI [0.09, 0.43], *p* = .007) conditions.

The significant interaction between time and dispositional attachment avoidance (ECR-12) was explored further using Pearson’s correlations. This revealed a significant positive correlation between dispositional attachment avoidance (ECR-12) and combined mean change scores (*r* = .27, *p* = .023), such that those higher in avoidance showed greater change in state security from pre- to post-manipulation, regardless of condition.

### 5.3.2.2. *SAAM Anxiety*

For state attachment anxiety, there was no significant main effect of condition. However, there was a significant main effect of time (*F*(1, 66) = 4.47, *p* = .038, ηp2 = .06), indicating a significant increase between pre- (*M* = 4.10, 95% CI [3.82, 4.37]) and post- (*M* = 3.98, 95% [3.70, 4.26) test. The results also revealed a significant interaction between condition and time (*F*(2, 132) = 4.14, *p* = .018, ηp2 = .06), and a significant interaction between condition, time, and ECR-12 avoidance (*F*(2, 132) = 3.30, *p* = .040, ηp2 = .05). Post-hoc analysis (with Bonferroni adjustment) revealed state attachment anxiety mean change scores increased significantly following the attachment security condition (*M* = 0.08, 95% CI [-0.10, 0.27]) when compared with the mindfulness induction (*M* = -0.26, 95% CI [-0.44, -0.08], *p* = .011) and control (*M* = -0.18, 95% CI [-0.37, 0.01], *p* = .048) conditions, hence H1 was only partially supported.

The significant interaction between condition, time, and dispositional attachment avoidance (ECR-12) was explored by conducting separate Pearson’s correlations. However, no significant associations were reported between mean change scores and dispositional avoidance in any condition. To examine this interaction further, a 3 x 2 mixed factorial ANOVA was conducted to examine and compare state anxiety change scores between participants with ‘high’ (*n* = 36) and ‘low’ (*n* = 34) dispositional attachment avoidance, defined by a median split of ECR-12 Avoidance – scores above 3 were rated as low and those above were rated as high. While there was a significant main effect of condition (*F*(2, 136) = 3.74, *p* = .026), no main effect of dispositional avoidance, and no interaction between condition and dispositional avoidance were reported.

### 5.3.2.3. *SAAM Avoidance*

For state attachment avoidance, there was no significant main effect of condition but there was a significant effect of time (*F*(1, 66) = 24.26, *p* < .001, ηp2 = .27). Across conditions, there was a significant decrease from pre- (*M* = 3.00, 95% CI [2.71, 3.30]) to post- (*M* = 2.63, 95% CI [ 2.35, 2.90]) test for state attachment avoidance (see Table 5.2).

### 5.3.2.4. *SMS Mind*

For state mindfulness of mind, there was a significant main effect of condition (*F*(2, 132) = 33.22, *p* < .001, ηp2 = .34), significant main effect of time (*F*(1, 66) = 81.03, *p* < .001, ηp2 = .55), indicating a significant increase between pre- (*M* = 8.08, 95% CI [7.50, 8.65]) and post- (*M* = 10.90, 95% [10.43, 11.38]) test. The results also revealed a significant interaction between condition and time (*F*(2, 132) = 41.26, *p* < .001, ηp2 = .39). For each condition, there was a significant increase in SMS mind from pre to post-test (see Table 5.2). Post-hoc analysis (with a Bonferroni adjustment) revealed state mindfulness of mind increased significantly following each experimental condition, although mean change scores increased significantly more so following the attachment security prime condition (*M* = 6.41, 95% CI [6.01, 6.81]) when compared with the mindfulness induction (*M* = 1.26, 95% CI [0.80, 1.73], *p* < .001) and control (*M* =1.86, 95% CI [1.24, 2.48], *p* < .001) conditions. That is to say, the attachment security prime was most effective in increasing state mindfulness of mind, while the mindfulness induction and control condition produced comparable results.

### 5.3.2.5. *SMS Body*

For state mindfulness of body, there was a significant main effect of condition (*F*(2, 132) = 21.14, *p* < .011, ηp2 = .24), significant main effect of time (*F*(1, 66) = 52.52, *p* < .001, ηp2 = .44), indicating a significant increase between pre- (*M* = 7.32, 95% CI [6.79, 7.86]) and post- (*M* = 9.60, 95% [9.06, 10.15]) test. The results also revealed a significant interaction between condition and time (*F*(2, 132) = 25.33, *p* < .001, ηp2 = .28). For each condition, there was a significant increase in SMS body from pre to post-test (see Table 5.2). Post-hoc analysis (with a Bonferroni adjustment) revealed state mindfulness of body mean changes scores increased significantly following each experimental condition, although significantly more so following the mindfulness induction condition (*M* = 3.91, 95% CI [3.47, 4.34]) when compared with the attachment security prime (*M* = 1.38, 95% CI [0.95, 1.81], *p* <.001) and control (*M* = 1.56, 95% CI [1.05, 2.07], *p* <.001) conditions. While SMS body significantly increased following each condition, the mindfulness induction was most effective.

### 5.3.2.6. Intent to Drop Out

For intention to drop out of university, there was no significant main effect of condition (*p* = .497), no significant main effect of time (*p* = .066), but there was a significant interaction between condition and time (*F*(2, 132) = 3.25, *p* = .042, ηp2 = .05). The attachment security prime condition significantly reduced participant’s intentions to drop out of university (*M* change = -0.47, 95% CI [-0.70, -0.24]), but the mindfulness induction (*M* change = -0.03, 95% CI [-0.39, 0.34]) and control condition (*M* change = -0.40, 95% CI [-0.33, 0.25]) did not.

### Table 5.2 – *Means, standard error, and 95% CI of pre/post state measures of attachment and mindfulness across conditions (n = 70).*

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Measure | Condition | Pre-test | | | | Post-test | | | |
|  |  | M | SE | 95% LB | 95% UB | M | SE | 95% LB | 95% UB |
| SAAM Security | Security Prime | 5.15 | 0.14 | 4.88 | 5.42 | 5.81 | 0.13 | 5.56 | 6.06 |
|  | Mindfulness Induction | 5.28 | 0.11 | 5.05 | 5.51 | 5.49 | 0.12 | 5.24 | 5.74 |
|  | Control | 5.15 | 0.14 | 4.87 | 5.43 | 5.41 | 0.13 | 5.15 | 5.68 |
|  |  |  |  |  |  |  |  |  |  |
| SAAM Anxiety | Security Prime | 4.05 | 0.15 | 3.75 | 4.35 | 4.13 | 0.16 | 3.81 | 4.45 |
|  | Mindfulness Induction | 4.17 | 0.16 | 3.86 | 4.49 | 3.91 | 0.17 | 3.57 | 4.25 |
|  | Control | 4.07 | 0.15 | 3.75 | 4.38 | 3.89 | 0.15 | 3.60 | 4.17 |
|  |  |  |  |  |  |  |  |  |  |
| SAAM Avoidance | Security Prime | 3.04 | 0.17 | 2.70 | 3.38 | 2.61 | 0.15 | 2.30 | 2.91 |
|  | Mindfulness Induction | 2.96 | 0.17 | 2.62 | 3.30 | 2.59 | 0.16 | 2.26 | 2.91 |
|  | Control | 3.01 | 0.16 | 2.69 | 3.23 | 2.70 | 0.16 | 2.38 | 3.01 |
|  |  |  |  |  |  |  |  |  |  |
| SMS Mind | Security Prime | 8.25 | 0.35 | 7.56 | 8.95 | 13.61 | 0.25 | 13.12 | 14.10 |
|  | Mindfulness Induction | 7.97 | 0.35 | 7.27 | 8.67 | 9.23 | 0.37 | 8.50 | 9.96 |
|  | Control | 8.01 | 0.40 | 7.22 | 8.80 | 9.87 | 0.37 | 9.14 | 10.60 |
|  |  |  |  |  |  |  |  |  |  |
| SMS Body | Security Prime | 7.20 | 0.33 | 6.54 | 7.85 | 8.58 | 0.35 | 7.88 | 9.28 |
|  | Mindfulness Induction | 7.56 | 0.32 | 6.92 | 8.21 | 11.47 | 0.30 | 10.86 | 12.07 |
|  | Control | 7.21 | 0.33 | 6.56 | 7.86 | 8.77 | 0.38 | 8.01 | 9.53 |

### Table 5.2 – *continued.*

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Measure | Condition | Pre-test | | | | Post-test | | | |
|  |  | M | SE | 95% LB | 95% UB | M | SE | 95% LB | 95% UB |
| Intent to drop out | Security Prime | 5.48 | 0.32 | 4.84 | 6.12 | 5.01 | 0.30 | 4.41 | 5.61 |
|  | Mindfulness Induction | 5.11 | 0.32 | 4.47 | 5.75 | 5.08 | 0.32 | 4.44 | 5.73 |
|  | Control | 5.04 | 0.33 | 4.39 | 5.70 | 5.00 | 0.31 | 4.38 | 5.62 |

# 5.4. Discussion

To my knowledge, this is the first study to demonstrate that primed attachment security is the most effective method for increasing mindfulness in relation to cognitive processes. Although the present study builds on the work of Pepping and colleagues (2015), it is the first to examine and compare the efficacy of these brief experimental manipulations on both state attachment and state mindfulness. The results lead me to reason that there is an immediate causal relationship between state attachment and state mindfulness. Again, if this relationship was indeed bidirectional, the attachment security prime and mindfulness induction would have been expected to produce comparable results for both state measures.

State mindfulness of mental events (SMS Mind) increased significantly following each experimental manipulation, but significantly more so following the security prime. This finding is supportive of H2 and H3. The effect size calculation (ηp2) for the interaction between condition and time suggests that this is a large effect size (Cohen, 1988). The difference in mean change scores of SMS Mind following the security prime and mindfulness induction was 4.1. That is to say, the attachment security prime used in the present study was more effective at increasing state mindfulness of the mind than the mindfulness induction. However, this was not the case for state mindfulness of the body (SMS Body). Although SMS Body significantly increased following each session, the mindfulness induction had the greatest effect on this facet of state mindfulness, supporting H2. Again, the effect size calculation for the interaction between condition and time suggests a large effect.

Taken together, these results suggest that a single session of priming attachment security, using an engaging auditory stimuli, is an effective way to increase state mindfulness of mind, over and above a mindfulness specific exercise. These results were supportive of H3. In the present study, priming security produced a significant increase in state attachment security and reduction in state attachment avoidance, supportive of H1 and H3 but not H2. It is possible that priming attachment security dampens the deactivation of the attachment system characteristic of attachment avoidance. The security prime used in the present study required participants to think about an individual they were close to. I propose that this exercise may reduce the avoidance of proximity seeking and denial of attachment needs which ultimately frees up necessary resources that enables individuals to pay attention to their experiences, thoughts, and emotions. This, in turn, results in increased mindfulness capabilities specific to such mental events. It should also be noted that state attachment avoidance reduced significantly following the mindfulness induction and control conditions.

For the first time, it is possible to argue that attachment orientation plays a causal role in the development of mindfulness, but that the reverse may not be true. There are two key points in the present findings that merit discussion, specifically: (i) priming attachment security increased state mindfulness of mind (compared to mindfulness and control); and (ii) state attachment security improvements are moderated by attachment avoidance.

## 5.4.1. Attachment Security Priming Increases State Mindfulness

Mindfulness practice increases state mindfulness (Carmody & Baer, 2008). We found that priming mindfulness, through breath-focused meditation, was most effective in increasing mindfulness of body, but that priming attachment security was more effective in increasing state mindfulness of mind. These findings are supportive of H2. The distinction between mindfulness of mind vs. body and manipulation efficacy is interesting, not least because it is again the cognitive aspects of mindfulness that are affected here. That the mindfulness induction was most effective at increasing mindfulness of body, but second to the attachment security prime in increasing mindfulness of mind, supportive of H3, may relate the quantity of body vs. mind content in the exercise (100 words more on bodily sensations than mental ones). However, it is important to note that such focus on bodily sensation is a core feature of mindfulness practice. It is tempting to assume that this latter effect is a result of reducing the negative impact of attachment insecurity on the capacity for mindfulness. However, the security prime did not reduce state attachment anxiety to a greater extent than the other conditions, suggesting this is unlikely. These results partially supported H1. An alternative explanation involves examining the security prime, which asks participants to think about a secure attachment relationship, and visualise feeling cared for and supported in a challenging situation. This could elicit negative feelings associated with the challenging situation, but also reassurance of support from loved ones, and thus processing both negative and positive thoughts and feelings in a non-defensive manner. These are the hallmarks of mindfulness, and the rehearsal of adaptive cognitive processing involved in the security prime may account for its positive effects on mindfulness of mind.

## 5.4.2. Attachment Orientation Improvements Moderated by Attachment Avoidance

In the present study, trait avoidance interacted with the experimental manipulations in predicting post-prime state security. Somewhat surprisingly, dispositional attachment avoidance amplified the efficacy of the experimental inductions. More bluntly, those exhibiting greater attachment avoidance reported greater increases in state attachment security following each induction. That avoidance seems to increase the effectiveness of all conditions on state security is curious. Attachment avoidance is characterised by a dampening of affective responses, suppression of negative thoughts, and high self-reliance (Mikulincer & Shaver, 2003), self-esteem (Brennan & Morris, 1997), and a disconnect between bodily sensations and subjective experience (Diamond & Fugandes, 2010). It is possible, then, that those highest in avoidance have the most to gain from visualisations designed to promote feelings of positivity associated with secure relationships (the security prime), or to focus on bodily sensations (the mindfulness induction) or to relax (the control condition).

As state attachment security significantly increased following the mindfulness induction, which did not support H4, it is possible that the influence of dispositional attachment avoidance on SMS Mind following the mindfulness induction is due to the simultaneous priming of attachment security. Therefore, this enhanced state security, as in the security priming condition, leads to an immediate increase of mindfulness capabilities. This is further supported by the security prime significantly increasing SMS Mind over and above the mindfulness induction. In the present sample, dispositional attachment avoidance was significantly positively correlated with the observe facet of mindfulness. That is to say, those individuals exhibiting greater attachment avoidance have a heightened ability to notice internal and external stimuli. Such an association could, in part, explain the reported effects of the security prime and mindfulness induction. Throughout the literature, the observe facet has been both negatively and positively associated with attachment avoidance. In their recent meta-analysis (Chapter 2), Stevenson and colleagues (2017) reported a significant negative association between attachment avoidance and observe, albeit a small effect size.

## 5.4.3. Intention to drop out of University

Priming attachment security resulted in a significant reduction in intent to drop out of university. This finding was partially supportive of H5. Considering the wealth of empirical research detailing the salutary effects of mindfulness practice and the continual championing of introducing mindfulness practice into HE (e.g., Bush, 2011; de Bruin, Meppelink, & Bögels, 2015) it is interesting that drop out intent remained almost constant following the mindfulness induction. As discussed in Chapter 1 (section 1.5.1.), attachment security has been repeatedly associated with positive mental health outcomes amongst students – including reduced stress, adaptive coping, and increases in psychological well-being. To the best of my knowledge, there is currently no published research into the effects of security priming on the intent to drop out of university, and as such, there is nothing to compare these findings to. Interestingly, Poerio et al. (2016) reported the benefits of social daydreaming for students during their transition to university including positive mood and social adaptation. It is possible that even daydreaming about higher-quality relationships is enough to activate the secure base schema, in turn promoting socio-emotional adjustment to university life.

I theorise that the reduction in dropout intent is a result of the activation of the secure base schema (Waters et al., 1998). The security prime used in the present study directed participants to think about an individual with whom they share a secure attachment and to reflect on (or imagine) a time in which they supported them. It is possible that the activation of this schema, overrides other attachment representations and the support and reliance they are actively recounting translates directly to their university experience. That is to say, perhaps even the act of reflecting on past or imagined support provided by a close attachment figure is enough to bolster one’s self confidence, self-efficacy, or ability to cope. In this instance the ability to cope is to persist with the pursuit of HE. These results can be compared with the findings of Chapter 3, where engaging in adaptive and active coping behaviours mediated the relationship between resilient mental functioning (a factor comprising act with awareness, non-judging, non-reacting cognitive reappraisal and low attachment anxiety) and psychological well-being outcomes.

## 5.4.4. Theoretical Implications

I suggest that dispositional attachment orientation is one primary social antecedent of mindfulness. The present findings begin to uncover the direction and development of this relationship and have far-reaching implications.

Developmentally, the organisation of the attachment system and inner working models, resultant of caregiver warmth and availability, not only influence the way in which we view ourselves and others, but also the capacity in which we attend to our experiences. This emphasises further the role of the caregiver in the development of dispositional mindfulness. As mindfulness is conceptualised as an internal cognitive awareness, it is not a product of observational learning, but rather a result of the organisation of our intrinsic attachment system. That is not to say that other regulatory systems may also play a role; a topic for future research.

The results present considerable implications for mindfulness practice. Augmenting attachment security could be a beneficial precursor to mindfulness practice; research has already found that enhancing attachment security augments willingness to engage in further mindfulness after an initial taster session (Rowe et al., 2016). Experimentally inducing feelings of felt security could bolster the beneficial outcomes of mindfulness by satisfying the attachment system and, subsequently, increasing mindfulness capabilities. Specifically, priming attachment security could support the adaptive state of equilibrium in the attachment system – neither hyper- nor de-activation, freeing up resources to achieve optimal psychological functioning.

## 5.4.5. The Absence of Secure Attachment Figures

An interesting point that warrants a brief discussion is the number of participants excluded from the experiment on the basis of not identifying as having at least one secure attachment figure (as determined by the Attachment Networks and Relationship-specific Attachment Styles measure (Rowe & Carnelley, 2003). A total of 30 out of 153 participants (19.61%) were excluded from the present study based on this criterion. However, if this percentage of participants does not consider themselves as having a secure attachment figure, it is worrisome for the wider student population as a whole. As the present study has demonstrated, attachment security priming is most effective for increasing the facet of mindfulness repeatedly linked to psychological functioning and well-being outcomes. This leaves those individuals unable to draw on a secure attachment relationship for the purpose of the exercise at a disadvantage when employing methods to increase mindfulness and mental functioning.

Additionally, the process and experience of leaving home and entering life as an undergraduate student presents its own challenges and stressors. It is increasingly important that students are well-equipped to deal with whatever challenges come their way in this period of independence. As mentioned throughout this thesis, attachment security has been repeatedly associated with lower perceived stress, adaptive coping, and increases in psychological well-being (see Mikulincer & Florian, 1998; Mikulincer & Shaver, 2007; Steele & Steele, 2008). However, it is appropriate to surmise that those students who do not have at least one secure attachment figure are more likely to be ill-equipped and rely on maladaptive methods when attempting to deal with university life. Research has long reported the negative association between undergraduate student stress and psychological well-being (Bailey & Miller, 1998; Dyson & Renk, 2006; Edwards et al., 2001). Poor adjustment to HE has been linked to poor academic performance and university dropout (Barr, 2007; Tinto, 1993). Moreover, students are more likely to leave HE institutions prematurely when they face greater social and emotional adjustment difficulties (Gerdes & Mallinckrodt, 1994).

## 5.4.6. Limitations and Future Directions

The sample used in the present study, was made up of a majority of first-year students, who, arguably, are experiencing a marked period of personality development. While the current results speak to the nature of these effects for similar individuals, they may not reflect similar processes across the lifespan or older students. Further to this criticism, and considering the contextual narrative of this thesis focuses on the well-being and retention of undergraduate students, the results are restricted to one higher education institution from the UK which impede the generalisability of the results to other student populations.

Another limitation could be raised considering the nature of the control condition task. All dependent variables improved from pre- to post- manipulation, which suggests that all conditions had a positive effect. It is likely that the control condition was a pleasant and relaxing experience, rendering an extremely stringent control – a strength of this work. Only for the measure of SMS Body were there significant differences in pre/post mean change scores between the mindfulness induction and control condition. While the two manipulations are similar, it is apparent that the mindfulness induction used in the present study taps into, and enhances, mindfulness of bodily experiences more so than the guided imagery control exercise. The similarities reported between the effects of these conditions, although a limitation of the control conditions itself, lend its hand to further supporting the idea that mindfulness of mental events (in this case SMS Mind) and mindfulness of bodily experiences are independent facets that are best enhanced using different methods. That being said, future research may wish to use a more neutral control condition, and measure potential mechanisms, such as positive affect, to attempt to further delineate the effects of each manipulation.

Issues may be raised with the inclusion of pre- and post- testing in the present study. However, to counter the possible effects of demand characteristics by which pre-test scores were simply repeated after the experimental manipulation, variability was increased by replacing the standard Likert scale with a sliding scale, allowing increments of 2 decimal places rather than whole numbers.

As alluded to already, there are a number of avenues for further research in this area, with the purpose of truly defining the relationship between adult attachment orientation and mindfulness. The logical next step to the work presented here would be to examine the effects of longer term interventions for mindfulness and attachment security. However, the time constraints inherent in a PhD rendered this work beyond the scope of the current research programme. While the present study offers us insight into the effects of a one-off experimental manipulation, attention should be directed to examining the effects of long-term repeated security priming on measures of state and trait mindfulness (and vice versa). Theoretically, this will allow more robust conclusions to be drawn regarding the causal nature of the relationship between adult attachment and mindfulness.

Considering adult attachment orientation and mindfulness are associated with similar outcomes related to well-being, future research should examine the efficacy of security priming methods compared to mindfulness practice to enhance aspects of well-being. More research is needed to evaluate which experimental manipulation (security priming or mindfulness practice) is most effective for promoting optimal psychological functioning and well-being, or whether a combination approach is an effective method. This may include anxiety, depression, stress, as well as psychological well-being (in a more refined sense i.e. SPWB, Ryff, 1989). Based on the results of the present study, it is possible to suggest that priming felt security may produce greater salutary effects than a mindfulness induction, and together the effects would be even greater. While it was hoped the audio priming method would fully engage participants, no measure of engagement was included. Therefore, I am only able to make assumptions about its engagement and speculate that the efficacy of the manipulation was partly due to its medium.

An audio prime could easily be integrated into a variety of resources (including web-based materials and mobile applications), making priming security, and its many benefits, more accessible to the general population – and with ease. Speaking to wider accessibility of such priming methods and, in light of technological advances and the utilisation (oftentimes reliance) of technology in today’s society, this could be a fruitful and inexpensive avenue to explore to promote student mental well-being and retention. Previous research has documented the effects of traditional, lab based priming methods on student adjustment (e.g., Adams, 2013) which gives rise to the benefits of this security prime.

In response to the large percentage of participants unable to identify a secure attachment figure, future research may wish to focus on utilising The Attachment Networks and Relationship-specific Attachment styles measure (see Rowe & Carnelley, 2003) in undergraduate, general population, and clinical samples. Such research will delineate whether the absence of a secure attachment figure is more common in undergraduate students or whether this issue may be a problem for the general population and specific clinical populations too. Finding this out is a crucial step for researchers interested in taking security priming from the lab to interventions for health and well-being (Carnelley, Otway, & Rowe, 2016). Regarding student well-being specifically, researchers should address whether there are differences in access to a secure attachment figure within different subgroups of student, such as those who move away from home to attend university, vs. those who remain local, vs. international students. Qualitative data collection methods may be considered to incorporate thematic analysis to examine any possible themes that may be associated with the findings. It is apparent that society has changed a lot since the beginning of social-cognitive attachment research (e.g. Hazan & Shaver, 1987). It would be beneficial to examine contemporary attachment formation, understanding the ever changing societal needs, and, ultimately, how this effects undergraduate students, their psychological functioning, and overall well-being.

# 5.5. Conclusions

Research has consistently documented the association between adult attachment and mindfulness (see Stevenson et al., 2017 for review) although the directionality and mechanisms underlying the relationship between these constructs are not yet well defined. Some have theorised that the relationship is bidirectional in nature with the possibility of attachment security (low anxiety and avoidance) facilitating mindfulness capabilities and vice versa (Ryan et al., 2007). The present study took an experimental approach, implementing a rigorous experimental paradigm to study the causal nature of this relationship in an attempt to determine whether one construct preceded the other or whether this relationship is indeed bidirectional. The results of this study challenge this view, and provide evidence to suggest a causal relationship from adult attachment to mindfulness at the state level. Specifically, priming felt security resulted in the greatest increase of state mindfulness of mind (in relation to mental events) across each of the experimental manipulations. These findings give reason to suggest that the development of attachment, and the subsequent functioning of the attachment system, is one of the primary antecedents of mindfulness. In contrast, the mindfulness induction resulted in the greatest increase in state mindfulness of body (in relation to bodily experiences and sensations) which could be attributed to the core quality of mindfulness practice of focusing on bodily sensations.

Together these results present considerable implications for mindfulness practice. Firstly, they reinforce the conceptual differences between mindfulness of mental events (SMS Mind) and mindfulness of physical experience and bodily sensations (SMS Body) as well as the differences in which they can be enhanced. Secondly, this study provides evidence to suggest that a one-off attachment security prime is more effective at increasing mindfulness related to mental events than a mindfulness induction. Moreover, these results present the possibility, and plausibility, of augmenting attachment security to enhance mindfulness capabilities or to be incorporated into mindfulness training aimed at promoting mental health and well-being. Considering the changes in state mindfulness of mind following the security prime condition, it could be argued that priming felt security is a better method of enhancing mindful awareness to mental events, including thoughts and emotions. On the other hand, to enhance mindful awareness of bodily sensations then a mindfulness induction would arguably work best.

# Chapter 6. General Discussion

Throughout this thesis, the main aim was to examine the relationship between adult attachment orientation and mindfulness. Intertwined with this main aim is the contextual research topic of how these constructs affect psychological functioning and well-being, specifically in undergraduate students. Intention to drop out of HE was examined as a real-world quasi-behavioural consequence. To that end, this thesis has presented: a systematic synthesis and meta-analysis of the current literature examining the relationship between attachment orientation and mindfulness (Chapter 2); an examination of the role of emotion regulation in the relationship between these constructs, and their effect on psychological well-being and dropout intent (Chapter 3); and a short-medium term longitudinal exploration of the stability and predictive relationship between the two constructs over time, and their predictive validity for well-being outcomes (Chapter 4); and finally, a lab experiment testing the causal direction of the relationship by manipulating each construct (Chapter 5). The present chapter will begin by outlining the key findings of this doctoral work (section 6.2) and the main conclusions which can be drawn from these findings (section 6.3), followed by a detailed discussion of the strengths (section 6.4) and limitations (section 6.5) of this research. Importantly, this Chapter will discuss the implications for future research based on these findings (section 6.6), before drawing the overall conclusions (section 6.7).

# 6.1. Summary of Key Findings

Chapter 2 presented the first synthesis, meta-analysis, and critical appraisal of the current literature examining the relationship between attachment orientation and mindfulness. Chapter 2 detailed a clear, significant relationship between both adult attachment dimensions and the facets of dispositional mindfulness. Throughout the reviewed literature, attachment anxiety and avoidance were consistently, negatively associated with, and in some cases statistically predictive of, total mindfulness. However, attachment anxiety was more often negatively associated with total mindfulness compared to attachment avoidance, the findings of which were reflected in the results of the meta-analysis.

These findings appear to be in line with contemporary accounts of attachment theory (Mikulincer & Shaver, 2016) as it appears as though individuals with higher attachment anxiety exhibit a hyperactivation of the attachment system. I propose that this hyperactivation may hinder the optimal functioning of the core facets of mindfulness (specifically act with awareness, non-judging, and non-reacting). One characteristic of this hyperactivation is a hypervigilance to threat, a behaviour which might explain the occasional positive association reported between attachment anxiety and the observe facet of mindfulness (Ryan et al., 2007). This hypervigilance could lead to more anxiously attached individuals noticing threat cues more readily, predisposing them to being more attentive and noticing such cues more readily than those high in attachment avoidance.

The meta-analysis revealed attachment avoidance to be significantly, negatively associated with total mindfulness as well as all of the individual facets (act with awareness, observe, describe, non-judging, and non-reacting). The deactivation of the attachment system could explain these relationships. Those individuals high in avoidance tend to cut off their emotions (Wei et al., 2005) and while these individuals are successful at suppressing unwanted thoughts, they can fail under cognitive load (Mikulincer et al., 2004), potentially undermining any facilitating effects on non-reactivity they may have had. Further, these individuals engage in a deactivation of the attachment system as a way to ignore or deny the potential threat of intimacy with others. Subsequently, this deactivation of the attachment system results in a diminished level of observation to threats.

Having found that extant research shows evidence of a negative relationship between the dimensions of attachment insecurity (anxiety and avoidance) and mindfulness, Chapter 3 examined this relationship in more detail, by collecting new data and examining the overlap between attachment, mindfulness, and emotion regulation, and also how well these constructs could predict coping and well-being. Additionally, in light of developments in the attachment literature, this study also included the dimension of adult disorganised attachment to provide additional depth to our understanding of the relationship between attachment orientation and mindfulness. Exploratory factor analysis was employed with a two-factor model being extracted from the included measures. The resultant factors were labelled Resilient mental functioning (accounting for 33% of variance) and Disorganised mental functioning(accounting for 14% of variance) and highlighted the interaction, and considerable overlap, between adult attachment, mindfulness, and emotion regulation and supported the view that the relationship between adult attachment and mindfulness may be bidirectional.

As this research focus has also addressed a secondary narrative of undergraduate students, intention to drop out of HE, and an overarching theme of mental health and well-being, these factors were also used to predict psychological well-being outcomes (autonomy, environmental mastery, personal growth, positive relations with others, purpose in life, and self-acceptance), via the mediating effects of activity and defeatism coping behaviours. The results revealed that defeatism coping behaviours were significantly associated with psychological well-being, and accounted for the relationship between resilient mental functioning and well-being. Such findings highlight the possibility of defeatism coping behaviours as a relevant mechanism for the association between mindfulness and lower psychological distress. Employing maladaptive coping behaviours negatively affects psychological well-being.

Addressing the cross-sectional nature of the majority of previous work examining attachment orientation and mindfulness, Chapter 4 set out to investigate the relationship longitudinally as a means to determine directionality. Having found that attachment insecurity, mindfulness, and emotion regulation share some overlap (see Chapter 3) this study was designed to identify the causal links between these variables. Participants completed measures of adult attachment, dispositional mindfulness, emotion regulation, and a battery of measures designed to assess well-being outcomes (perceived stress, coping, psychological well-being, and intent to drop out of university) at two separate time-points, fifteen weeks apart.

The results of this study further confirmed the previously reported associations between attachment orientations and the facets of mindfulness (Stevenson et al., 2017). Moreover, the results detailed the stability of these constructs over the fifteen-week period, as well as the stability of the direction of their associations. Hierarchical regression analysis was conducted to determine whether adult attachment orientation and dispositional mindfulness were significant predictors of one another between time-points. Out of all of the reported regression models, only two had significant contributions from the construct subscales, which were from adult attachment dimensions. Attachment anxiety (at T1) was a significant predictor of the mindfulness facets act with awareness and non-judging (at T2). No facet of mindfulness (at T1) was a significant predictor of either attachment dimension (at T2). Overall, the results of this study indicate that their relationship is not bidirectional as previously thought. The associations reported between constructs further suggest the role of attachment anxiety and hyperactivation of the attachment system in hindering the optimal fostering of essential underpinning constructs of mindfulness.

In light of the findings presented in Chapter 4, Chapter 5 attempted to further elucidate the causal nature of the relationship between adult attachment and mindfulness by examining whether manipulating one construct in the lab would produce a change in the other (at state level). In order to gain a better understanding of the relationship between these constructs, a rigorous experimental paradigm was used incorporating a within-subjects design to examine the capacity of priming attachment security (an intervention known to attenuate attachment anxiety) to increase mindfulness. This chapter also examined whether increasing mindfulness had any impact on attachment orientation. Not finding a predictive relationship over time does not necessarily mean that a causal relationship does not exist, especially as state variables might behave differently to trait variables. That is to say, by their very nature, states are sensitive to environmental changes and fluctuate to a greater degree than traits. The efficacy of a novel attachment security prime, a mindfulness induction, and a control relaxation at increasing state measures of attachment security and mindfulness were examined.

While participants reported greater mindfulness of mind and body following each of the experimental conditions (security prime, mindfulness induction, and control) the results indicated that priming attachment security was most effective at increasing measures of state attachment security and state mindfulness of mind (pertaining to mental events – including thoughts and emotions). Interestingly, an interaction was reported between dispositional attachment avoidance and the change in state security scores in each experimental condition. Those individuals reporting greater attachment avoidance exhibited greater changes from pre- to post- test following each condition. That is to say, change scores were contingent on an individual’s level of attachment avoidance, perhaps because they had the most to gain from a boost in felt security, induced mindfulness, or a relaxation exercise. The mindfulness induction led to the greatest increases of state mindfulness of body (mindful awareness of sensations). The results of this study further support the discoveries presented in Chapter 4, that the relationship between adult attachment and mindfulness is not bidirectional as there is a causal relationship between these constructs at the state level, with changes in felt security leading to greater change in state mindfulness than a mindfulness induction.

Addressing the secondary narrative pertaining to retention in higher education, a measure of intent to drop out of university was included in the pre- and post- battery of measures in each experimental manipulation. Results indicated that drop out intent significantly decreased following the attachment security prime only. Such results provide novel insight and an alternative approach to examine factors influencing students to drop out of or continue with their education. However, it should be noted that a significant proportion of the original sample did not have access to a secure attachment figure, which may make priming attachment security in such individuals difficult.

# 6.2. Conclusions from Key Findings

The series of studies presented in this thesis were designed to explore and determine the direction and causal nature of the relationship between adult attachment orientation and mindfulness (Chapters 2, 4, and 5) and their influence on psychological well-being (Chapters 3 and 4). Overall, the findings of this body of work suggest that this relationship is not bidirectional, but rather attachment orientation is an important antecedent and defining construct of mindfulness. The findings from Chapters 4 and 5 present significant implications for mindfulness practice and intervention development. Based on the findings from both studies, it is conceivable to consider priming attachment security as a possible, alternative, or additional method of promoting mindfulness of the mind, and, subsequently, well-being. At the very least, it is possible to suggest that augmenting adult attachment security could be a beneficial precursor to mindfulness practice as a means to boost individual mindfulness capabilities. Further to this, attachment security priming is also a viable avenue to explore when considering factors that affect intent to drop out of university.

## 6.2.1. The Relationship Between Adult Attachment Orientation and Mindfulness

It has previously been suggested that the constructs of adult attachment and dispositional mindfulness develop alongside one another in a bidirectional fashion (Ryan et al., 2007). This suggestion comes from the core qualities of attachment security fostering the development of mindfulness and vice versa. Prior to this doctoral work, the directionality and mechanisms of the relationship between these constructs was not well defined. However, taken together, the results of this body of work lead me to suggest that attachment orientation is an antecedent of mindfulness, with attachment anxiety predictive of some facets of mindfulness, longitudinally, and priming attachment security increases mindfulness of the mind or mindfulness capabilities towards mental events. Making advances to answer the ‘chicken or the egg’ question, this work has refuted the widely hypothesised bidirectional relationship between these two constructs (Ryan et al., 2007). The present findings speak to the directionality of their relationship. For the first time, it can be argued that attachment orientation (or attachment “style”) plays a causal role in the development of mindfulness, but the reverse is not true. There are two key points that emphasise this causal relationship further: (i) the predictive contribution of attachment anxiety to later mindfulness (Chapter 4); and (ii) the superior performance of the security prime (compared to the mindfulness induction and control condition) at increasing mindfulness of the mind (Chapter 5).

In Chapter 4, the constructs of adult attachment and dispositional mindfulness, and the direction of the associations between these two constructs were stable over a 15-week period. As this chapter explored the predictive value of each construct on the other across the two time points, it was found that attachment anxiety was a significant predictor of two facets of mindfulness (act with awareness and non-judging), but mindfulness facets were not a predictor of adult attachment orientation. This suggests that attachment anxiety, and the subsequent hyperactivation of the attachment system, impedes the capacity for mindfulness. The results reported in Chapter 3 suggest the possibility of a mechanism underlying this relationship, the role of emotion regulation abilities as a foundational commonality between these two constructs (Stevenson et al., 2019). Individuals high in attachment anxiety are prone to up-regulating their negative affect rather than adaptively down-regulating (Mikulincer et al., 2003) and have negative self-views (Bartholomew & Shaver, 1991). Such characteristics are the very antithesis of acting with awareness and being non-judging of the self.

Documented throughout the literature, mindfulness practice increases mindfulness (Carmody & Baer, 2008), however, when interpreting the results of Chapter 5, priming attachment security may be a more effective way to boost state mindfulness of the mind (an awareness of mental events). The security prime asked participants to think about a secure relationship, and visualise feeling cared for and supported in a challenging situation. This exercise involved opening oneself up to experiencing negative feelings associated with challenges but also the reassurance and support from a loved one. Together, this is an exercise in processing negative and positive thoughts in an undefended way – both core practices of mindfulness.

Within Chapter 5, the role of attachment avoidance was highlighted. Greater dispositional attachment avoidance led to a greater increase in state attachment security (pre- and post- test) in each of the conditions (security prime, mindfulness induction, and control). Further to this, attachment avoidance seemingly increased the effectives of all manipulations on state attachment security. As attachment avoidance is characterised by a dampening of affective responses, suppression of negative thoughts, self-reliance, and a disconnect between bodily sensations and subjective experience (Brennan & Morris, 1997; Diamond & Fugandes, 2010; Mikulincer & Shaver, 2003), it is possible that those exhibiting greater attachment avoidance have the most to gain from visualisations designed to promote feelings of positivity due to the heightened ability to notice internal and external stimuli and simultaneous priming of attachment security.

These results led to the conclusion that there is a causal relationship between these two constructs at state level, with attachment security leading to greater mindfulness of the mind. These results are contrary to those reported by Pepping and colleagues (2011), who attempted to establish the direction of this causal relationship but failed to compare the efficacy of their chosen mindfulness inductions and security priming methods. Further to this, they did not employ the same level of control as the procedure used here (which included a within-subjects design and matched valence across experimental conditions) nor did they control for baseline differences between groups so direct comparisons between manipulations cannot be made. If there were no causal relationship between the two variables we would have expected there to be no effect of a mindfulness induction on state attachment and vice versa. Additionally, if the relationship were bidirectional, we would have expected the attachment security prime and mindfulness induction to produce comparable results for both state measures of attachment and mindfulness. However, the efficacy of a one off attachment security prime of improving mindfulness should then be explored as to shape the best practice of promoting mindfulness capabilities and, subsequently, the benefits that come along with that.

## 6.2.2. Implications for Mindfulness Practice

Mindfulness-based practices and interventions are associated with a wide range of psychological and health benefits in both clinical and non-clinical populations (see Crowe et al., 2016; Grossman, Niemann, Schmidt, & Walach, 2004). Despite the well-documented benefits of mindfulness, the results of Chapters 4 and 5 present considerable implications for mindfulness practice – specifically when aimed at promoting optimal psychological functioning and improving mental health. The current experiments reveal priming attachment security may be a more effective way of boosting mindfulness capabilities related to mental events. Based on these findings, it is not without reason to suggest that augmenting adult attachment could be a beneficial precursor to mindfulness practice. Experimentally inducing feelings of felt security could bolster the beneficial outcomes of mindfulness by fostering a level of functional, balanced activation of the attachment system (as opposed to a deactivation or hyperactivation) and, subsequently, increasing mindfulness capabilities.

However, this appears to only be true for mindfulness related to mental events and experiences. The results of Chapter 5 present a clear distinction between mindfulness of the mind and of the body. Although state mindfulness of the body significantly increased following the security prime and control condition, the mindfulness induction was most effective. Research has documented the salutary effects of mindfulness-based practice on medical symptoms (Carmody, Reed, Kristeller, & Merriam, 2008). This highlights the potential for restructuring mindfulness-based programs depending on the desired outcome. Those that seek to alleviate clinical, mental health symptoms and promote optimal psychological functioning could look to incorporating aspects of attachment security priming. Interventions used to treat physical health symptoms and pain would be best served using traditional mindfulness resources.

## 6.2.3. Implications for Mental Health and Well-being in Undergraduates

Both attachment security and mindfulness have been linked to positive outcomes in higher education settings (e.g., Caldwell, Harrison, Adams, Quin, & Greeson, 2010; Lopez et al., 2002). This body of work speaks to the importance of adaptive coping, detailing the associations between activity coping behaviours, attachment orientation, mindfulness, and psychological well-being (Chapters 3 and 4). The current thesis found that: (i) both attachment orientation and mindfulness contribute to resilient mental functioning, a factor associated with adaptive coping and, subsequently, psychological well-being and intention to persist in HE; (ii) student attachment orientation is a predictor of the ability to adaptively cope with the pressures of university life while mindfulness was a significant predictor of perceived stress; and (iii) priming attachment security in a lab setting significantly reduced student intent to drop out of university.

Such findings support previous research into undergraduate student well-being. Specifically, throughout the literature both attachment orientation and mindfulness have been associated with adaptive coping behaviours, the ability to adapt and persist in HE, as well as increasing mental well-being (e.g., Gerdes & Mallinckrodt, 1994), further speaking to the importance of promoting the use of adaptive means of coping (e.g., Mortiz et al., 2016). It is apparent that student mental health and psychological functioning is compromised when they are unable to effectively cope and manage their new environment, along with additional social and emotional adjustments (Gerdes & Mallinckrodt, 1994). Such results give reason to suggest that, although possibly favourable to students, reducing stress in a HE would not be beneficial to student mental health. But rather, the implications of attachment orientation and mindfulness and their influence on the employment of adaptive coping behaviours should not be ignored.

Congruent with the importance of the ability to effectively cope with the stressors of university life, Chapter 5 is the first study to offer empirical support for the potential benefits of security priming as an easily accessible and inexpensive method reduce drop out intention in HE. Considering university drop out is an example of a clear coping-related outcome, the effect of security priming on student efforts to persist, or feel they have the wherewithal (i.e. support, confidence, or ability) to persist in their HE endeavours is encouraging. Research has documented the benefits of priming attachment security in the lab but is yet to explore the benefits of utilising the novel audio prime. The ease at which it is possible to incorporate this potentially, widely beneficial exercise into resources aimed at promoting psychological well-being has the potential to alleviate the demands faced by student health services and lead to happier and mentally healthier students.

Indeed, the results of the current work have been utilised in an early-stage pilot programme aimed at reducing undergraduate student stress and promoting mental well-being (“Fly: Mental well-being for your everyday”).

# 6.3. Strengths of this Work

One of the main strengths of this work is the use of multiple methods of data collection (cross-sectional, longitudinal, and experimental). In doing so, the relationship between adult attachment and mindfulness has been examined from a multitude of angles, addressing questions about the nature of the relationship, its direction, origins and causality, as well as establishing a possible foundational commonality between the two. This comprehensive overview of these constructs, their relationship, and the way they interact with one another also provide valuable insight into the influence of these constructs on psychological functioning and well-being. The use of multiple methodologies directly addressed the methodological issues evidenced in previous literature (see Pepping et al., 2015; Stevenson et al., 2017). With the aim of building on the predominantly cross-sectional literature, Chapter 4 worked with longitudinal data while Chapter 5 established state changes in the lab, both of which represent considerable advancement to the field.

Additionally, Chapter 5 addressed the lack of audio stimuli within the attachment priming literature. As previously discussed, the novel prime developed as part of this doctoral thesis is not only substantially longer than other priming methods, but as it was designed as a guided imagery exercise. It is immersive, actively engaging individuals throughout its duration. Developing this priming stimulus to closely resemble the temporal nature of a mindfulness induction allowed for direct comparison of the changes of the two constructs, removing any possible interference of differences in manipulation delivery. Although further exploration is needed to fully understand the benefits of this prime, from the preliminary findings presented in this thesis, and assuming that it is engaging, it begins to bridge the gap between experimentally priming attachment in a laboratory setting and applications in the real world. It is possible that the efficacy of this prime is transferable to both real-world and clinical practice settings considering the shift towards mobile-based applications designed to benefit mental health functioning and behavioural healthcare. Previously, smartphone applications have been successfully used to promote physical health and could also be instrumental in reducing some of the stigma attached to seeking help. In recent years, there has been an increase in the development of mindfulness-specific applications made accessible to the general population. While a majority of these apps focus on self-guided meditation with limited support for measuring the effectiveness of the practice, they are, nonetheless, popular (Daudén Roquet & Sas, 2018). Additionally, self-guided mindfulness applications have resulted in psychosocial well-being improvements (e.g., Champion, Economides, & Chandler, 2018; Economides, Martman, Bell, & Sanderson, 2018) and improvements in student well-being (Moffitt, 2017).

As mobile phones and technology are integrated into the daily lives of students, they can be used discreetly to participate in app-based mental health support programmes. Such a platform will also allow for online assistance for nonthreatening issues that is not only feasible, but also capable of reaching a large population (Crisp & Griffiths, 2014).

The implications of the results presented in this body of work for mindfulness practice itself have been discussed. In uncovering the causal relationship between adult attachment and mindfulness, the results of this work have led me to conclude that priming attachment security has greater, immediate effects on state mindfulness than a purposefully developed mindfulness induction. Therefore, augmenting attachment security could be a beneficial precursor to mindfulness practice. Experimentally inducing feelings of felt security could bolster the beneficial outcomes of mindfulness by satisfying the attachment system and, subsequently, increasing mindfulness capabilities.

# 6.4. Limitations of this Work

Although the studies presented here are a valuable step in understanding the relationship between adult attachment and mindfulness, the role of attachment orientation in the development of mindfulness, and their influence on psychological well-being, they are subject to certain limitations.

The measures included in Chapters 3, 4, and 5 were all based on self-reports. While the use of self-report measures to assess predominantly internal mechanisms (like the constructs studied throughout this doctoral thesis) is considered best practice and demonstrate good internal consistencies and test-retest reliabilities, it is possible that certain biases may have occurred. However, there are currently no observational methods for successfully measuring mindfulness (trait or state) or a majority of included constructs (such as psychological well-being). While there is an observational method to assess adult attachment (Adult Attachment Interview; George et al., 1996) this avenue was not explored due to time and cost restrictions. That being said, self-report measures are frequently used throughout the attachment literature and despite the inherent issues with self-report data, remains an appropriate way to measure attachment in adulthood, as is the FFMQ to tap into all five facets of mindfulness.

An issue may be raised with the time-frame of data collection in Chapter 4. The aim of the chapter was to examine the stability of adult attachment and mindfulness, as well as the stability of their relationship, over time (as well as the stability of other variables). A period of 15 weeks was deemed adequate for data collection as a short-medium term, but questions remain as to the nature of the relationship between the key constructs in the longer term. Future research is required to assess attachment orientation and mindfulness over longer time periods.

Another possible limitation of this work is the over-representation of women in the samples. Although gender was not considered as a moderator in these studies, previous research has not identified gender as a significant moderator when examining the relationship between adult attachment orientation and mindfulness (see Stevenson et al., 2017 for review) or the effects of attachment security manipulations (e.g., Mikulincer & Shaver, 2001). However, this does not definitively mean that these constructs operate in the same or their relationships function in the same way in both males and females. Research has reported gender differences in the use of emotion regulation strategies (e.g., McRae et al., 2008) and employment of coping behaviours (e.g., Tamres, Janicki, & Helgeson, 2002). Therefore, the small percentage of males makes it difficult to generalise the conclusions to both genders with confidence.

Speaking further to issues of generalisability, at present, it is not known how generalisable the findings are to those individuals who are not currently enrolled in an undergraduate education. While the sampling employed throughout was beneficial for the secondary research topic of psychological well-being and retention of undergraduate students, the reliance on solely student sample may be problematic for the wider implications of the work (see Gillath & Karantzas, 2019; Stevenson et al., 2017 for reviews). However, the use of student samples, and over reliance on opportunity sampling, appears to be a common problem in attachment research, and in social psychology more generally. Future research should seek to address this, as detailed below.

Even in regards to the larger student population, there are still issues of generalisability. The student population is more diverse today than historically (Shah, Bennett, & Southgate, 2015) and specific subgroups that face additional challenges and stressors may require more support. Future research on student well-being and retention needs to explore whether the predictive pathways identified here are the same for all student groups (e.g. mature students, international students, students with disabilities).

# 6.5. Recommendations for Future Research

The following sections will discuss recommendations for future work in this area.

## 6.5.1. Replication and Extension

Due to the paucity of work which has attempted to examine the causal nature of the relationship between adult attachment and mindfulness, the main focus of future work should be on the replication and extension of the current findings. Given that Chapter 5 of this thesis is the first study to compare the efficacy of security priming and mindfulness manipulations and provides evidence to refute the theory of bidirectionality, replication is necessary to establish the robustness of the present findings. While the results presented here are by no means conclusive, they have advanced our understanding of the causal relationship between adult attachment and mindfulness. In order to continue enhancing our understanding of these constructs the content of the mindfulness induction should be considered. The induction used in Chapter 5 focused on mindfulness of the breath and noticing of thoughts. As the SMS mind subscale measured the noticing of both thoughts and emotions, it would be beneficial to compare the attachment security prime to an emotion focused mindfulness meditation and address the question of whether priming attachment security is easier to access than varying forms of mindfulness practice.

Considering the longitudinal nature of the relationship between constructs, the present research (Chapter 4) provides a good starting off point that future research can build on. Here, I have established the short-term stability of not only mindfulness (each of the 5 facets) but also the associations between adult attachment and mindfulness. However, it is possible that these associations may begin to change over longer periods of time. An examination of both constructs, utilising multiple data collection points over a greater time frame would help address these issues. To fully understand the relationship between these two constructs it would be valuable to examine them throughout childhood to see how they develop together and change overtime in response to the influence of later cognitive developmental periods which significantly impact a child’s meta-cognitive capacities.

Greco, Baer, and Smith (2011) developed the Child and Adolescent Mindfulness Measure (CAMM) however this only provides summed scores of total mindfulness. Therefore, and in light of the interest in, and benefits of, mindfulness, future research may wish to develop a childhood measure of the five facets presented by Baer et al. (2006) which would be a beneficial addition to the suite of mindfulness measures available. This would allow for the detection of development as well as consistency in monitoring these facets throughout the lifespan in relation to attachment orientation.

Extensions of this work should examine the effects in the general population so that more robust inferences and generalisations can be made. Future studies should include a more diverse sampling of adults, including individuals from different societies, thus providing a comprehensive overview of the relationship between adult attachment and mindfulness on a global scale.

Considering the contextual narrative of this body of work, replicating the findings in Chapter 5 has important implications for mindfulness practice. The results of Chapter 5 led to the conclusion that it may be possible to augment attachment security as beneficial precursor to mindfulness practice or as a possible alternative (only when concerning mindfulness related to mental events and not physical sensations).

## 6.5.2. Attachment Security Prime

Chapter 5 presented an examination of the efficacy of a mindfulness induction and a novel security prime. This appears to be the first audio prime developed to experimentally induce feelings of felt security, at least according to published research. Although the results of Chapter 5 led to the conclusion that the security prime was superior at improving state mindfulness, future research should be conducted to evaluate the prime compared to other traditionally used priming methods. Although it can be classified as a one-off, brief manipulation (at 9 minutes 23 seconds) the prime is still considerably longer than methods such as supraliminal priming and recall tasks previously used throughout the literature (see Gillath & Karantzas, 2019 for review).

The audio prime significantly increased state attachment security and future studies should seek to validate this stimulus further. One likely avenue of research would be to test the efficacy of this novel prime compared to other priming methods such as recall tasks, subliminal priming, and the commonly used writing task (Bartz & Lydon, 2004). It is important that we not only understand how this prime may have influenced state mindfulness of mental events but also how it increases state attachment security compared to other methods. As this stimulus engages individuals by guiding them through an active visualisation of a close attachment figure, it is plausible to hypothesise that, following this method of inducing felt security, greater increases in state attachment security would be recorded when compared to other methods. These patterns, if confirmed by subsequent research, will shed light on both attachment security and that nature of more effective methods of bolstering security and, subsequently, optimal psychological functioning. Understanding how to effectively augment attachment security will provide additional ideas about how to incorporate these methods into resources designed to improve psychological well-being. Additionally, to address an aforementioned limitation, future research should seek to measure levels of engagement with supraliminal primes when administered in a laboratory setting, and beyond, in real world, applied settings.

While promising, the results detail the effects of one off, brief experimental manipulations aimed at enhancing state measures. Future research may wish to explore the effects of repeated priming of attachment security and mindfulness training on both constructs at the dispositional level. It is possible that long term interventions repeatedly priming attachment security (e.g., Carnelley & Rowe, 2007) may not only lead to changes in attachment orientation but also dispositional mindfulness. Future work should seek to examine the mechanisms that drive the security priming effect on mindfulness of mind and distinguish between the two facets of state mindfulness (mind and body).

## 6.5.3. Representative Student Samples

Although the secondary narrative of this thesis was centred around the mental health and retention of undergraduate students, future research must first seek to address the issues of sampling, specifically in Chapters 3 and 5. While interesting insights have been revealed throughout this thesis, for reasons of convenience, the majority of students who participated were first year, psychology students from a single institution. While this is a common occurrence in psychological research, it is far from ideal. For instance, first year students face a different set of challenges and stressors than final year students and students who have switched courses and find themselves starting the process all over again. Therefore, it is important that future research ensures that adequate, and representative, samples are recruited.

# 6.6. Overall Conclusions

This doctoral work aimed to advance our current understanding of the relationship between adult attachment and mindfulness and how these constructs influence undergraduate student mental health, well-being, and retention. To achieve this, a multi-modal approach was taken to examining these constructs and their associations, by assessing them cross-sectionally, longitudinally, and experimentally. The results of this body of work refute the previously purported theory of bidirectionality of the relationship, and development, of attachment orientation and mindfulness and argues for attachment orientation as a primary antecedent of mindfulness. This work also presents implications for mindfulness practice and has presented an audio stimulus for attachment security priming that begins to bridge the gap between priming in the laboratory and the real-world.

Addressing the applied context of student psychological well-being and retention, this body of work highlights the detriment of reliance on maladaptive coping behaviours, irrespective of resilient mental functioning, and the effectiveness of attachment security priming at reducing drop out intent. Given that university represents a period of social and emotional challenges while keeping up with the demands of academic load, the real-world implications of this work should be utilised. Accordingly, taking into account the present findings, HE institutions should consider making resources available to students with a focus on teaching them effective and appropriate ways to cope and face their stressors – as to avoid any detrimental psychological effects of prolonged avoidance of stressors (Holahan & Moos, 1987). This might include educating students who are deemed at risk of falling into such a cycle (i.e. based on low class attendance, counsellor referral where applicable) on proactive and positive ways to cope with stressors. Additionally, institutions may wish to provide this education to all enrolled students to promote adaptive coping as a preventative measure, which could, in turn, be instrumental in student stress management and help institutional retention efforts.

However, this work is still in its infancy. As outlined above, future work should seek to replicate and extend the results of this research programme, including an examination of the development of adult attachment and mindfulness across the lifespan to truly address causation with certainty. Given the effectiveness of the novel attachment security prime, this should be compared to more traditional methods to determine its suitability in the aforementioned mental health resources.

Together, this doctoral work provides not only a basis for further exploration of the relationship between adult attachment orientation and mindfulness, but also their influence on student mental health and well-being, and potential methods to promote optimal psychological functioning and reduce intention to drop out of HE.

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**Appendices**

**Appendix 1 – Measures**

**Demographic Items**

What is your age? \_\_\_\_\_\_\_

Please indicate your gender:

* Male
* Female
* Other
* Prefer not to answer

Please specify your race or ethnic origin. \_\_\_\_\_\_\_

What is your course of study? \_\_\_\_\_\_\_

Please indicate your year of study:

* 1st
* 2nd
* 3rd
* 4th
* 5th
* 5+

**Experiences in Close Relationships-Revised (ECR-R)**

*Global Wording*

*Instructions*: Below are a number of statements regarding how people feel and behave in their closest relationships. Please respond according to how you feel and behave generally in these relationships. Please indicate the extent to which you agree with the following statements. Do this by placing a number from the scale below in front of each statement.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Strongly  Disagree |  |  | Neutral |  |  | Strongly  Agree |

1. I prefer not to show people close to me how I feel deep down.
2. I worry about being abandoned.
3. I am very comfortable being close to others.
4. I worry a lot about my relationships.
5. Just when people start to get close to me I feel myself pulling away.
6. I worry that people won't care about me as much as I care about them.
7. I get uncomfortable when people want to be very close.
8. I worry a fair amount about losing my relationships.
9. I don't feel comfortable opening up to others.
10. I often wish that my loved one's feelings for me were as strong as my feelings for them.
11. I want to get close to others but I keep pulling away.
12. I often want to merge completely with others, and this sometimes scares them away.
13. I am nervous when others get too close to me.
14. I worry about being alone.
15. I feel comfortable sharing my thoughts and feelings with those I am close to.
16. My desire to be close sometimes scares others away.
17. I try to avoid getting close to others.
18. I need a lot of reassurance that I am loved by those close to me.
19. I find it relatively easy to get close to others.
20. Sometimes I feel that I force others to show more feeling, more commitment.
21. I find it difficult to allow myself to depend on others.
22. I do not often worry about being abandoned.
23. I prefer not to be close to others.
24. If I can't get those close to me to show interest in me, I get upset or angry.
25. I tell those close to me just about everything.
26. I find that others don't want to get as close as I would like.
27. I usually discuss my problems and concerns with those close to me.
28. When I'm involved in a relationship, I feel somewhat anxious and insecure.
29. I feel comfortable depending on others.
30. I get frustrated when those I am close to aren't around me as much as I would like.
31. I don't mind asking others for comfort, advice, or help.
32. I get frustrated when those close to me are not available when I need them.
33. It helps to turn to others in time of need.
34. When those close to me disapprove of me, I feel really bad about myself.
35. I turn to others for many things including comfort and reassurance.
36. I resent it when those I am close to spend time away from me.

**Adult Disorganized Attachment Scale (ADA)**

*Instructions*: Please read each of these items and indicate whether you agree or disagree with them using the scale provided.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Strongly  Disagree |  |  | Neutral |  |  | Strongly  Agree |

1. Fear is a common feeling in close relationships.
2. I believe that romantic partners often try to take advantage of each other.
3. I never know who I am with romantic partners.
4. I find romantic partners to be rather scary.
5. It is dangerous to trust romantic partners.
6. It is normal to have traumatic experiences with the people you feel close to.
7. Strangers are not as scary as romantic partners.
8. I could never view romantic partners as totally trustworthy.
9. Compared to most people, I feel generally confused about romantic relationships.

**Five Facet Mindfulness Questionnaire – Short Form (FFMQ-SF)**

*Instructions*: Below is a collection of statements about your everyday experience. Using the scale below, please indicate, how frequently or infrequently you have had each experience in the last month. Please answer according to what really reflects your experience rather than what you think your experience should be.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 |
| Never or very rarely true | Not often true | Sometimes true, sometimes not true | Often true | Very often or always true |

1. I'm good at finding the words to describe my feelings.
2. I can easily put my beliefs, opinions, and expectations into words.
3. I watch my feelings without getting carried away by them.
4. I tell myself that I shouldn't be feeling the way I'm feeling.
5. It's hard for me to find the words to describe what I'm thinking.
6. I pay attention to physical experiences, such as the wind in my hair or sun on my face.
7. I make judgements about whether my thoughts are good or bad.
8. I find it difficult to stay focused on what's happening in the present moment.
9. When I have distressing thoughts or images, I don't let myself be carried away by them.
10. Generally, I pay attention to sounds, such as clocks ticking, birds chirping, or cars passing.
11. When I feel something in my body. it's hard for me to find the right words to describe it.
12. It seems I am "running on automatic" without much awareness of what I'm doing.
13. When I have distressing thoughts or images, I feel calm soon after.
14. I tell myself I shouldn't be thinking the way I'm thinking.
15. I notice the smells and aromas of things.
16. Even when I'm feeling terribly upset, I can find a way to put it into words.
17. I rush through activities without being really attentive to them.
18. Usually when I have distressing thoughts or images I can just notice them without reacting.
19. I think some of my emotions are bad or inappropriate and I shouldn't feel them.
20. I notice visual elements in art or nature, such as colours, shapes, textures, or patterns of light and shadow.
21. When I have distressing thoughts or images, I just notice them and let them go.
22. I do jobs or tasks automatically without being aware of what I'm doing.
23. I find myself doing things without paying attention.
24. I disapprove of myself when I have illogical ideas.

**Emotion Regulation Questionnaire (ERQ)**

*Instructions*: We would like to ask you some questions about your emotional life, in particular, how you control (that is, regulate and manage) your emotions. The questions below involve two distinct aspects of your emotional life. One is your emotional experience, or what you feel like inside. The other is your emotional expression, or how you show your emotions in the way you talk, gesture, or behave. Although some of the following questions may seem similar to one another, they differ in important ways.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Strongly  Agree |  |  | Neutral |  |  | Strongly  Disagree |

1. When I want to feel more positive emotion (such as joy or amusement), I change what I’m thinking about.
2. I keep my emotions to myself.
3. When I want to feel less negative emotion (such as sadness or anger), I change what I’m thinking about.
4. When I am feeling positive emotions, I am careful not to express them.
5. When I’m faced with a stressful situation, I make myself thinking about it in a way that helps me stay calm.
6. I control my emotions by not expressing them.
7. When I want to feel more positive emotion, I change the way I’m thinking about the situation.
8. I control my emotions by changing the way I think about the situation I’m in.
9. When I am feeling negative emotions, I make sure not to express them.
10. When I want to feel less negative emotion, I change the way I’m thinking about the situation.

**BriefCOPE**

*Instructions*: These questions deal with ways you've been coping with the stress in your life. There are many ways to try to deal with problems. These questions ask what you've been doing to cope with the stress in your life recently. Obviously, different people deal with things in different ways, but we are interested in your personal experiences. Each question says something about a particular way of coping we want to know to what extent you've been doing what the item says - How much or how frequently. It doesn't matter if you think the strategy is working or not. Please answer on the basis of how much you've been trying it. Try to rate each question separately in your mind from the others. Make your answers as true FOR YOU as you can.

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | 2 | 3 | 4 |
| I haven’t been doing this at all | I’ve been doing this a little bit | I’ve been doing this a medium amount | I’ve been doing this a lot |

1. I've been turning to work or other activities to take my mind off things.
2. I've been concentrating my efforts on doing something about the situation I'm in.
3. I've been saying to myself "this isn't real".
4. I've been using alcohol or other drugs to make myself feel better.
5. I've been getting emotional support from others.
6. I've been giving up trying to deal with it.
7. I've been taking action to try to make the situation better.
8. I've been refusing to believe that it has happened.
9. I've been saying things to let my unpleasant feelings escape.
10. I’ve been getting help and advice from other people.
11. I've been using alcohol or other drugs to help me get through it.
12. I've been trying to see it in a different light, to make it seem more positive.
13. I’ve been criticizing myself.
14. I've been trying to come up with a strategy about what to do.
15. I've been getting comfort and understanding from someone.
16. I've been giving up the attempt to cope.
17. I've been looking for something good in what is happening.
18. I've been making jokes about it.
19. I've been doing something to think about it less, such as going to movies, watching TV, reading, daydreaming, sleeping, or shopping.
20. I've been accepting the reality of the fact that it has happened.
21. I've been expressing my negative feelings.
22. I've been trying to find comfort in my religion or spiritual beliefs.
23. I’ve been trying to get advice or help from other people about what to do.
24. I've been learning to live with it.
25. I've been thinking hard about what steps to take.
26. I’ve been blaming myself for things that happened.
27. I've been praying or meditating.
28. I've been making fun of the situation.

**Ryff’s Scales of Psychological Well-being (SPWB)**

*Instructions*: Please indicate your degree of agreement to the following sentences.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 | 6 |
| Strongly disagree |  |  |  |  | Strongly agree |

1. I am not afraid to voice my opinions, even when they are in opposition to the opinions of most people.
2. In general, I feel I am in charge of the situation in which I live.
3. I am not interested in activities that will expand my horizons.
4. Most people see me as loving and affectionate.
5. I live life one day at a time and don't really think about the future.
6. When I look at the story of my life, I am pleased with how things have turned out.
7. My decisions are not usually influenced by what everyone else is doing.
8. The demands of everyday life often get me down.
9. I think it is important to have new experiences that challenge how you think about yourself and the world.
10. Maintaining close relationships has been difficult and frustrating for me.
11. I have a sense of direction and purpose in life.
12. In general, I feel confident and positive about myself.
13. I tend to worry about what other people think of me.
14. I do not fit very well with the people and the community around me.
15. When I think about it, I haven't really improved much as a person over the years.
16. I often feel lonely because I have few close friends with whom to share my concerns.
17. My daily activities often seem trivial and unimportant to me.
18. I feel like many of the people I know have gotten more out of life than I have.
19. I tend to be influenced by people with strong opinions.
20. I am quite good at managing the many responsibilities of my daily life.
21. I have the sense that I have developed a lot as a person over time.
22. I enjoy personal and mutual conversations with family members or friends.
23. I don't have a good sense of what it is I'm trying to accomplish in life.
24. I like most aspects of my personality.
25. I have confidence in my opinions, even if they are contrary to the general consensus.
26. I often feel overwhelmed by my responsibilities.
27. I do not enjoy being in new situations that require me to change my old familiar ways of doing things.
28. People would describe me as a giving person, willing to share my time with others.
29. I enjoy making plans for the future and working to make them a reality
30. In many ways, I feel disappointed about my achievements in life.
31. It's difficult for me to voice my own opinions on controversial matters.
32. I have difficulty arranging my life in a way that is satisfying to me.
33. For me, life has been a continuous process of learning, changing, and growth.
34. I have not experienced many warm and trusting relationships with others.
35. Some people wander aimlessly through life, but I am not one of them.
36. My attitude about myself is probably not as positive as most people feel about themselves.
37. I judge myself by what I think is important, not by the values of what others think is important.
38. I have been able to build a home and a lifestyle for myself that is much to my liking.
39. I gave up trying to make big improvements or changes in my life a long time ago.
40. I know that I can trust my friends, and they know they can trust me.
41. I sometimes feel as if I've done all there is to do in life.
42. When I compare myself to friends and acquaintances, it makes me feel good about who I am.

**Intentions to Drop Out of University**

*Instructions*: Please choose the answer that best reflects your feelings for each of the following questions regarding your thoughts of dropping out of university.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Not at all |  |  | Sometimes |  |  | Very much so |

1. I sometimes consider dropping out of university
2. I intend to drop out of university
3. I sometimes feel unsure about continuing my studies year after year.

**Perceived Stress Scale 4 (PSS-4)**

*Instructions*: The questions in this scale ask you about your feelings and thoughts during the last month. In each case, you will be asked to rate how often you felt or thought a certain way.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 |
| Never | Almost never | Sometimes | Fairly often | Very often |

In the last month how often have you...

1. Felt that you were unable to control the important things in your life?
2. Felt confident about your ability to handle your personal problems?
3. Felt that things were going your way?
4. Felt difficulties were piling up so high that you could not overcome them?

**Attachment Networks and Relationship-specific Attachment Styles (Adapted)**

*Instructions:* Please follow the instructions below carefully:

For each description indicate whether there is a close significant other in your life that matches that description (this can include parents, friends, romantic partners) and how representative it is of how you feel in that relationship by using the following scale:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 |
| Not very representative |  | Neutral |  | Very representative |

Sometimes relationships that are really important to us can be characterised by negative feelings or bad experiences - please do not exclude ANYONE you feel close to on the basis of bad experiences you have had with them. If a significant other is very important to you, include them regardless of the quality of the relationship you share.

**1. It is easy for me to become emotionally close to others. I am comfortable depending on others and having others depend on me. I don't worry about being alone or having others not accept me.**

**2. I am comfortable without close emotional relationships. It is very important to me to feel independent and self-sufficient, and I prefer not to depend on others or have others depend on me.**

**3. I want to be completely emotionally intimate with others, but I often find that others are reluctant to get as close as I would like. I am uncomfortable being without close relationships, but I sometimes worry that others don't value me as much as I value them.**

**4. I am uncomfortable getting close to others. I want emotionally close relationships, but I find it difficult to trust others completely, or to depend on them. I worry that I will be hurt if I allow myself to become too close to others.**

**State Adult Attachment Measure (SAAM)**

*Instructions*: The following statements concern how you feel right now. Please respond to each item by indicating how much you agree or disagree with it as it reflects your current feelings. Please indicate using the scale below how you feel at the moment.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Strongly  Agree |  |  | Neutral |  |  | Strongly  Disagree |

1. I am afraid someone will want to get too close to me.
2. I feel like I have someone to rely on.
3. I feel secure and close to others.
4. I feel loved.
5. I really need to feel loved right now.
6. The idea of being emotionally close to someone makes me nervous.
7. I want to share my feelings with someone.
8. If someone tried to get close to me, I would try to keep my distance.
9. I feel a strong need to be unconditionally loved right now.

**State Mindfulness Measure (SMS)**

*Instructions*: There is a list of statements below. Please use the rating scale to indicate how well each statement describes your experiences in the past 10 minutes. Please reflect on what you were doing during this 10 minute period of time.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 |
| Not at all | A little | Somewhat | Well | Very well |

1. I noticed physical sensations come and go.
2. I noticed pleasant and unpleasant thoughts.
3. I clearly physically felt what was going on in my body.
4. I noticed pleasant and unpleasant emotions.
5. I noticed emotions come and go.
6. I noticed some pleasant and unpleasant physical sensations.

**Appendix 2 – Chapter 3 Supplementary Table**

Supplementary Table 3.1 – *Demographic characteristics of participants (n = 174).*

|  |  |
| --- | --- |
| Characteristic | Number (%) |
|  |  |
| Mean age ± SD | 21.18 ± 5.77 |
| Nationality |  |
| UK/British | 142 (81.6) |
| EU | 10 (5.7) |
| International | 22 (12.6) |
|  |  |
| Gender |  |
| Male | 43 (24.7) |
| Female | 128 (73.6) |
| Not disclosed | 3 (1.7) |
|  |  |
| Academic Year |  |
| First | 92 (52.9) |
| Second | 40 (23) |
| Third | 21 (12.1) |
| Fourth | 15 (8.6) |
| Fifth | 4 (2.3) |
| Sixth + | 2 (1.1) |
|  |  |
| Faculty of Study |  |
| Psychology | 51 (29.3) |
| Arts and Humanities | 30 (17.2) |
| Engineering | 20 (11.5) |
| Medicine, Dentistry, and Health | 8 (4.6) |
| Science | 33 (19) |
| Social Sciences | 32 (18.4) |
|  |  |

*Note.* Psychology has been separated from the Faculty of Science to form a category

of its own due to the high percentage of psychology students who take part in social

science research.

**Appendix 3 – Chapter 4 Supplementary Table**

Supplementary Table 4.1 – *Demographic characteristics of all participants who completed T1 (n = 219) and T2 (n = 84).*

|  |  |  |
| --- | --- | --- |
| Characteristic | Number (%) | |
|  | T1 | T2 |
|  |  |  |
| Mean age ± SD | 19.42 ± 2.87 | 19.89 ± 3.92 |
| Nationality |  |  |
| UK/British | 166 (75.8) | 65 (77.4) |
| EU | 23 (10.5) | 6 (7.1) |
| International | 30 (13.7) | 13 (15.5) |
|  |  |  |
| Gender |  |  |
| Male | 66 (30.1) | 25 (29.8) |
| Female | 150 (68.5) | 57 (67.9) |
| Not disclosed | 3 (1.4) | 2 (2.4) |
|  |  |  |
| Academic Year |  |  |
| First | 171 (78.1) | 60 (71.4) |
| Second | 15 (6.8) | 6 (7.1) |
| Third | 22 (10) | 11 (13.1) |
| Fourth | 5 (2.3) | 4 (4.8) |
| Fifth | 5 (2.3) | 3 (3.6) |
| Sixth + | 1 (0.5) | 0 (0) |
|  |  |  |
| Faculty of Study |  |  |
| Psychology | 85 (38.8) | 30 (37.5) |
| Arts and Humanities | 36 (16.4) | 12 (14.3) |
| Engineering | 30 (13.7) | 14 (16.7) |
| Medicine, Dentistry, and Health | 7 (3.2) | 3 (3.6) |
| Science | 36 (16.4) | 13 (15.5) |
| Social Sciences | 25 (11.4) | 12 (14.3) |
|  |  |  |

*Note.* Psychology has been separated from the Faculty of Science to form a category

of its own due to the high percentage of psychology students who take part in social

science research.

**Appendix 4 – Chapter 5 Supplementary Tables**

Supplementary Table 5.1 – *Demographic characteristics of participants (n = 70).*

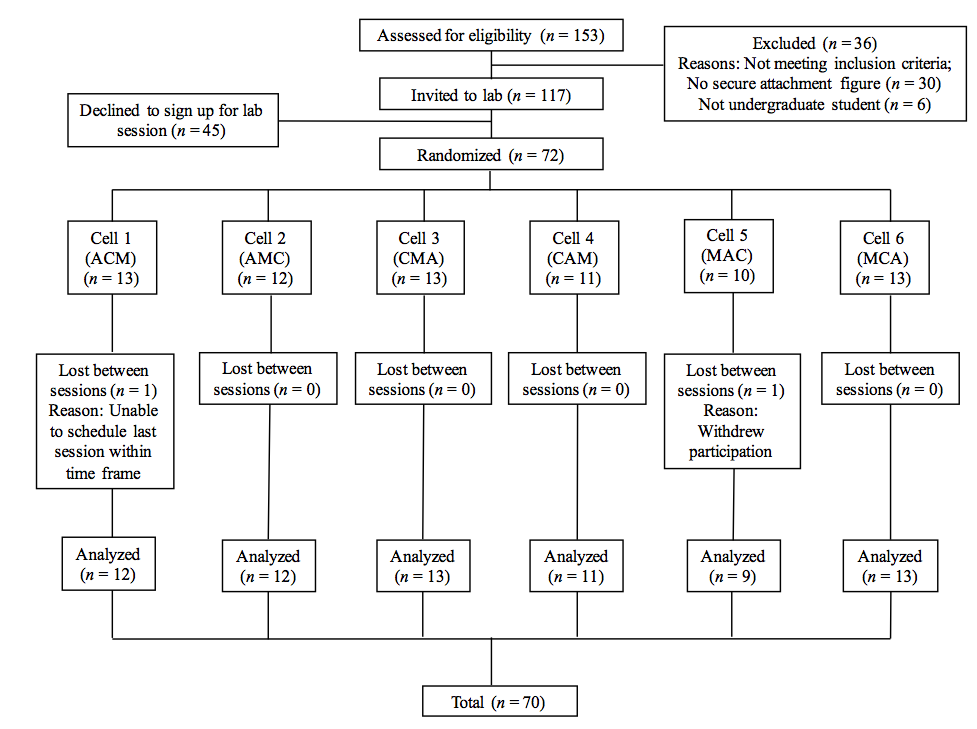
|  |  |
| --- | --- |
| Characteristic | Number (%) |
|  |  |
| Mean age ± SD | 21.26 ± 7.55 |
| Nationality |  |
| UK/British | 56 (80) |
| EU | 2 (2.9) |
| International | 12 (17.1) |
|  |  |
| Gender |  |
| Male | 13 (18.6) |
| Female | 57 (81.4) |
| Not disclosed |  |
|  |  |
| Academic Year |  |
| First | 58 (82.9) |
| Second | 6 (8.6) |
| Third | 4 (5.7) |
| Fourth | 2 (2.9) |
| Fifth | 0 (0) |
| Sixth + | 0 (0) |
|  |  |
| Faculty of Study |  |
| Psychology | 51 (72.9) |
| Arts and Humanities | 3 (4.3) |
| Engineering | 4 (5.7) |
| Medicine, Dentistry, and Health | 4 (5.7) |
| Science | 3 (4.3) |
| Social Sciences | 5 (7.1) |
|  |  |

*Note.* Psychology has been separated from the Faculty of Science to form a category

of its own due to the high percentage of psychology students who take part in social

science research.

Supplementary Table 5.2 – *Participant flow diagram.*



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**Appendix 5 – Chapter 5 Security Prime Auditory Stimuli Script**

I am now going to take you through a guided visualisation. The purpose of this visualisation is not necessarily to feel more relaxed or calm or better than you did at the start of the visualisation. The purpose of this is to just simply experience the images. So take a few moments now to settle into a comfortable position. Some people struggle with getting images, and others find it easy, but please just do your best.

Nobody is perfect all the time, and nobody gets it right with us all the time, but I’d like you to think about a person who is important to you, with whom you feel comfortable and safe. Try to imagine that they have been, over a fairly long period of time, consistently available to you, sensitive to your needs, and highly reliable. This person clearly has your best interests at heart and is willing to support you in every way they can.

In the relationship you have had with this important person, you have found that it was easy to be emotionally close to the other person. In this relationship, you felt comfortable depending on this person. You have also been comfortable having them depend on you. In this relationship, you have never particularly worried about being alone. You have also never worried about this person not accepting you.

Now try to picture your important person in the scenario I’m going to describe. It doesn’t matter at all if you struggle to get clear images. The goal is just to experience how it feels…

I would like you to think about a situation in which you deal with one of life’s difficulties. It’s a problem that you cannot solve on your own. It can be real or made-up. It’s a situation or time when you felt distressed, upset, or worried.

Take a moment to visualise this problematic situation. You can’t deal with it on your own. You need some help from your loved ones.

Now I would like you to imagine that your important person is there with you. They understand the problem you are facing. They listen to you. They are sensitive, and they totally understand your distress. They are totally in tune with your needs in that moment. They want to help you, and their only motivation for wanting to help and support you is that they love you and care about you.

Take this time to think about how good it feels to know that this person will come to your aid like this. You don’t have to feel bad or indebted - you know that they would readily leave other activities to come and assist and support you, and there are no strings attached to their help. This is just a given in your relationship with this person. They are willing and able to share your burden, and you feel able to let them.

Think about how this person might, support and help you. Maybe it’s what they say that always makes you feel better. Maybe it’s the expression on their face that makes you know that things are going to be just fine. Maybe they just know what to do to help you resolve things for yourself. You know this person will always be there for you, and you know very deeply that you can rely on them. Reflect on how you feel when this person is there. Perhaps it’s a sense of safety, knowing that you are not alone in this. Perhaps you feel a sense of being cared for, knowing that they are looking out for you. Relief, because you know that with their support, you can solve this situation. Knowing that your important person is there for you, you simply feel lighter.

There is no need to worry that this person will leave you alone. There is no need to worry that this person will be anything other than totally accepting of you. There is no need to worry that this person has anything other than your best interests at heart. Things just feel warm and easy in their presence, and they make you feel completely content.

Take a few minutes to enjoy this feeling of complete ease and sense of security that you get from just being with this person.

And when you’re ready, open your eyes, and come back to the room.

**Appendix 6 – Chapter 5 Mindfulness Induction Auditory Stimuli Script**

I am now going to take you through a guided mindfulness meditation. The purpose of this meditation is not necessarily to feel more relaxed or calm or better than you did at the start of the meditation. The purpose of this is to just simply practice mindfulness. So taking a few moments now to settle into a comfortable position **–** wiggle into a position so that your back is straight, but not rigid. Place your feet squarely on the ground. If you wear glasses, you may like to take them off. And gently closing your eyes if you feel comfortable doing so. And if not, just find a spot on the floor to focus on.

Feeling all the points of contact between your body and the chair, and just settling into the stillness. Let’s begin by just noticing that you can feel your feet on the ground. Notice that you can feel the bottom of your feet in your shoes.

Just settling into this... bringing attention now to the feeling of the palms of your hands. And either paying attention to what you’re touching or the feeling of contact. Or perhaps the feeling of the air or the temperature of the air on your palms. And just bringing all your attention and awareness to this part of the body.

And now shifting attention to the sensation of breathing. We’re not trying to change the breath in any way. It doesn’t have to become deeper or slower or calmer. Just paying attention to the breath as it is in this moment.

Throughout this meditation we will be using the breath as an anchor. So every time you find that your mind wanders, you start thinking, or responding to sounds or thoughts as they arise, every time you notice this, just time and time again, bring your mind back to the breath – that is, your attention back to the breath.

And so now for the next few moments, just sitting, and bringing your attention to the feeling of the in-breath, and the feeling of the out-breath. Holding in awareness that part of the body where the breath feels most vivid or strong for you. It might be your abdomen, or your chest or nose or throat. Just bringing all your attention and awareness to that part.

Every time you find your mind has wandered, just gently bring your attention back to the breath.

You may already find that your mind has wandered. And your mind is just doing what minds do. You may be noticing thoughts about the meditation, whether you are doing it right, whether this is boring. You may have thoughts about how relaxing or calming this feels. No matter what your thoughts are, just know that they are thoughts, they’re mental events that come into the mind, and just as easily, if you leave them well alone, they will also go out of your mind, and be replaced by more. You may be noticing bizarre or random thoughts. You might be planning what you will do for the rest of the day or tomorrow.

The purpose of a mindfulness meditation is not to stop your thoughts or suppress them or resist them or get rid of them. It’s just to know that you’re thinking and then shift your attention back to the breath. So your thoughts become like background chatter – like a radio going in the background – they are there, your mind is chattering away, and you are just not getting caught up with it.

Just noticing your breathing and what is happening in the present moment. So breathing in, and breathing out... just simply observing the breath, in this moment.... And now in this moment....

Just breathing in, and just breathing out. Being aware of everything that is happening, in each moment, as it passes.

You may be becoming aware of feelings and sensations as you’re sitting for this amount of time. You may be noticing themes of discomfort, or itches as you sit. See if you can experience these just as sensations. You may notice thoughts like this really hurts, or this is unbearable, or I have to scratch. And again, just because they’re thoughts doesn’t mean they are real or that you have to obey them. Just be willing to experience it – be open to allowing it to be there. Holding these sensations in one part of awareness, and focusing on the breath at the same time.

And observing your minds reaction. Perhaps your mind is irritated. Perhaps your mind is telling you to scratch, or to move. And if you do decide to move, or to itch, just do so mindfully.

And then just coming back to the breath, and allowing things to be, just as they are. Just breathing in, and just breathing out. Letting thoughts and sensations just enter awareness and then leave awareness. And continue to focus on your breath.

So mindfulness is awareness of everything that is happening in the present moment. Just allowing it to be there. Being willing to have the experience you are having. And just breathing in, and just breathing out.

Being aware of whatever is happening in the present moment. If you find you’re lost in thoughts, just notice where your mind went. And bring your mind back to the breath. You might find that the background chatter gets less. Or maybe it doesn’t. Regardless of what’s happening... just come back to the breath.

And now bring your attention and awareness to the feeling in your body on the chair. And all the points of contact between you and the surface. And now just notice that you can feel your feet on the ground. Notice that you can feel the bottom of your feet in your shoes.

Then bring your attention to the palms of your hands. Whether they are touching the chair, or your body, or whether you can just feel the temperature of the air on them...just bringing your attention to the palms of your hands. Now gently bring your attention and awareness of the room around you. And when you’re ready, open your eyes, and come back to the room.

**Appendix 7 – Chapter 5 Control Condition Auditory Stimuli Script**

I am now going to take you through a guided imagination exercise. The purpose of this visualisation is not necessarily to feel more relaxed or calm or better than you did at the start of the visualisation. The purpose of this is to just simply experience the images. So take a few moments now to settle into a comfortable position. We’re going to spend some time visualising images and scenery. Some people struggle with getting images, and others find it easy, but please just do your best.

I’m going to guide you through an imagined woodland walk. You can close your eyes and let your imagination fill in all the details as you are guided down the path. The path may look familiar to you, or it may be somewhere you have never been.

I want you to imagine that you are walking along the edge of a field towards a small wood just ahead of you.

The sun is out, the skies are clear. The air is bright and fresh. You walk into the wood along a narrow path between the trees.

The wood is composed of many kinds of trees. Many of the trees are tall and reaching up toward the skies. Some of the trees are smaller and younger saplings. You notice the dark textured brown barks on the trees. The leaves are different shades of green.

The trees extend their leafy branches down to the earth. The branches of the trees wave towards you. Gaze at the trees and focus on how they move in the wind. Watch as their branches sway effortlessly back and forth, some making creaking sounds as they do.

Brightly coloured birds call from the wood, their voices rising and fading. You notice several different bird songs sounding. You can also hear the breeze fluttering through the leaves on the trees. You take a moment to enjoy these sounds.

Thousands of shades of green moss carpet the ground beneath the trees. Sunlight plays with the leaves and casts shadows on the path. You can smell the damp earth and can see a haze of blue in the distance. You feel the twigs breaking under your feet.

The upper canopy of the trees covers you like a stained glass roof overhead. The light green leaves against the light blue and white sky create a glowing, ambient light. The movement of the leaves create a dappling in the light. The light is gentle and soothing.

Look up to see the bits of the clear blue sky through the tops of the trees. Catch glimpses of birds as they fly from one tree to the next.

In front of you a winding path leads up a gentle sloping hill through the trees. Feel the path beneath your feet as you travel through the wood. The trees become denser and the air becomes cooler. It becomes darker as the trees grow closer together.

You can see blue sky through the trees. All around you are bluebells, bobbing their heads in the breeze, creating a colourful floral carpet along the ground of the wood. The scent of the bluebells wafts around you.

Ahead of you is a large log that has fallen and settled in the middle of the wood. You sit on the log and look around you at the wood. Run your hand along the branch, feeling the contours of the rough, old bark.

The woodland creatures are going about their daily business, unaware of your presence. A robin comes close and you can see the bright red of his chest. Along the log, you see beetles and ants scurrying along. Above you, the branches of the trees make strange shapes against the sky. There are sounds of bird song and the breeze passing through the tree branches.

You can hear a stream running past somewhere nearby.

After you rest for a while, enjoying your surroundings, you decide that you are now ready to leave the wood. You see the path that led you here and start walking back the way you came. As you walk back you notice the familiarity of the trees. You see the entrance to the path up ahead. As you approach the entrance, you stop for a moment, taking in all of the sights and sounds of nature. You turn around and look down at the path beneath you, taking note of what you can see and what you can hear.

And when you feel ready, opening your eyes and once again taking in the room.