Resilience in academic stress: Exploring the role of cognition in how students adjust to life at the University of York

Karisha K. George

PhD

University of York

Psychology

September, 2014

Abstract

The main aim of tertiary education is to prepare students to make a positive contribution to society by developing within them the ability to function efficiently and effectively within the workplace. However, research is instead showing that during university life, more than half of all students report a high prevalence of mental health problems (Stallman, 2010), leading to a disruption of studies (Jackson, Pancer, Pratt & Hunsberger, 2000) and a subsequent failure to develop as anticipated (Stallman, 2011). This suggests that there is a need to invest in programmes which aid students in adjusting to being at university. Researchers recommend that such programmes focus on building students' levels of resilience; their capacity to adapt and grow in response to university life (Stallman, 2011). This thesis aims to clarify how universities can promote student adjustment by exploring the cognitive processes that influence the levels of resilience of students high on negative trait emotion. Negative trait emotion refers to the predisposition to experience intense and frequent negative emotion (Rosenberg, 1998) and has been highlighted as exerting a harmful impact on individuals' abilities to adapt to their experiences. Therefore, in this way, the thesis aims to uncover the cognitive mechanisms that should be targeted in order to improve students' capacity to adjust and grow while at university, enabling them to subsequently perform at a high standard post-graduation.

Table of Contents

List of Figures

List of Tables

Acknowledgements

Firstly, I would like to thank my supervisor, Dr. Joanna Clarke, for her continued support throughout my PhD journey. She entered a foreign research area and provided indispensable guidance in focusing and developing the various ideas included in the current thesis.

I must also thank the members of my Thesis Advisory Panel, Professor Andy Ellis and Roland Woodward, for their encouragement and recommendations. Andy's keen eye for detail helped me to always prioritise clarity and precision. Roland was continuously focused on linking the findings to what he saw in his workplace, always highlighting the practical implications. Thank you both for your support.

In addition to the five postgraduate students who performed the content analyses reported in this thesis – Ahuti Das, Stefania Fulginiti, Ian Hamilton, Kenisha Hanson and Raven Hills – I would like to thank my friends and colleagues who provided avenues not only for advice but also for fun de-stressing escapades. I want to especially thank Candace Miguel, Cindy Govia, Nazera Abdul-Haqq, Kofoworola Yewande Ogundeji, WoolAnn Sommerville and my fellow PhD adventurers hailing from the Psychology and the Law and Management Departments.

My greatest gratitude goes to my family. I must specifically thank my mother, Moulda George, who spurred me on with both her words and her example, making me believe that the sky is the limit. I would also like to thank my two amazing sisters, Kandie and Karrille, whose late night pep talks and consistent love and care helped me tremendously. This would especially not have been possible without my dad, Michael Llewellyn, whose steady flood of encouraging sayings and "you can do it" slogans kept me going.

And, last, but not least, the most heartfelt thanks goes to my church "family" at St. Wilfrid's R.C. Church, York, who unknowingly provided me with joy and encouragement through their smiles, random road trips and incessant jokes. I would especially like to thank the clergy, Ann Saunders, Mama Perry, Mela Kelly, Damian Kelly and all the members of the young adults group and the choir.

Declaration

This thesis comprises the candidate's own original work and has not been submitted previously or simultaneously to this or any other University for a degree. All experiments were designed and conducted by the candidate under the supervision of Dr. Joanna Clarke. Selected aspects of the research described in this thesis have been published and presented elsewhere.

Publications

George, K. (2013). It's not what happens to you, but how you think about it: Exploring the cognitive processes underlying resilience following adversity. In R. Fox and N. Monteiro (Eds.), *Making Sense of Pain: International and Multidisciplinary Perspectives.* Witney Oxfordshire, United Kingdom: Inter-Disciplinary Press.

George, K. & Clarke, J. (2013). Why doesn't adversity make everyone stronger? Mediators of the relationship between trait emotion and resilience. *Psychology Research 3*(5), 290-301.

Presentations

George, K. (2012, August). Comparing the role of automatic and longer term cognitive processes. Poster presented at the 2012 British Psychological Society Social Section Annual Conference, Edinburgh, Scotland.

George, K. (2013, May). It's not what happens to you, but how you think about it: Exploring the cognitive processes underlying resilience among university students. Paper presented at 'Making Sense of Pain' 2012. Prague, Czech Republic.

Chapter 1 Literature review

This thesis aims to explore how students adapt to university life. Entry into university has been described as a challenging time for students (Jackson, Pancer, Pratt & Hunsberger, 2000). For instance, Jackson et al. (2000, p. 2101) argued that:

> ... beginning university can be a significant life transition in
> which people's ability to adjust is challenged. New students who
> are commencing university studies and becoming immersed in
> campus social life often find the experience to be not only
> exciting, but also frightening and difficult. Most new students
> must adapt to a new and unfamiliar campus and living
> arrangement, become acquainted with a new set of peers, and
> face an increase in academic challenges.

Therefore, understanding the factors which influence student adaptation is an important area in need of research.

The thesis performs its analyses by examining students' levels of resilience. Resilience refers to the capacity to "bounce back" from one's life experiences without exhibiting symptoms of psychopathology (Campbell-Sills, Cohen & Stein, 2006). Students' levels of resilience were examined because higher levels of resilience have been linked to good psychological adjustment following life experiences while difficulties in developing higher levels of resilience have been associated with serious adjustment problems after these events (Campbell-Sills et al., 2006; Fine, 1991; Flach, 1990, 1990; Richardson, 2002). This suggests that students' levels of resilience may play an important role in whether or not they

adapt to their university experiences. In line with this, researchers have recommended the need to focus on building students' levels of resilience in order to aid in their adjustment to university (Stallman, 2011). Therefore, within this thesis student adaptation to university was assessed by evaluating students' levels of resilience.

The thesis specifically explores the influence of cognition on the levels of resilience of students within the University of York. It examines the impact of three cognitive processes: the mechanisms through which individuals' beliefs, assumptions and goals (their schemas) influence how they monitor, reflect on and respond to their experiences (Cantor, 1990). The three processes evaluated include automatic cognitive processes, longer term cognitive processes (henceforth referred to as thinking styles) and meaning making. Automatic cognitive processes occur unconsciously; they are processes over which individuals have no control (Beck & Emery, 1985; Beck et al., 1979). Longer term cognitive processes involve individuals thinking attentively, frequently and/or repetitively about themselves, their experiences, their concerns, their futures and their worlds (Beck, 1976; Beck & Emery, 1985; Beck et al., 1979; Segerstrom, Stanton, Alden & Shortridge, 2003; Watkins, 2008). Meaning making comprises individuals' attempts to make sense of the experience. It includes the stories they tell themselves about the event and how they think and rethink their lives as a result of its occurrence (Fine, 1991; Horowitz, 1986; Kelly, 1955).

In particular, the thesis compares the impact of adaptive and maladaptive automatic and longer term cognitive processes on how students make meaning of their university lives (Beck & Emery, 1985; Beck et al., 1979). This assessment

was performed based on the arguments of Beck et al. (1985, 1979) and

Fredrickson (2001). On the one hand, Fredrickson argues that adaptive cognitive

processes influence adjustment by enabling individuals to find meaning in their

experiences. In support of her claims, researchers have substantiated finding

meaning (completing the meaning making process) as the main cognitive process

impacting whether individuals are able to adjust to their experiences (Bower,

Kemeny, Taylor & Fahey, 1998; Davis & Morgan, 2008; Fine, 1991; Flach, 1990;

Michael & Snyder, 2005; Richardson, 2002; Salsman, Segerstrom, Bretching,

Carlson & Andrykowski, 2009; Updegraff, Silver & Holman, 2008). On the other

hand, Fredrickson asserts that maladaptive cognitive processes also impact

adjustment; however, they do so by preventing individuals from finding meaning

in their experiences. Researchers have also supported these claims; they posit that

maladaptive cognitive processes hinder adjustment by causing individuals to

respond in a dysfunctional manner to their experiences and prolong their

dysfunction long after the experience had passed (Beck & Emery, 1985; Beck et

al., 1979).

In line with these arguments, the thesis evaluates whether student

adaptation to university is related to: (1) dysfunctional longer term cognitive

processes and the absence of finding a meaning in university life and/or (2)

adaptive cognitive processes and the finding of meaning in university life. It

specifically explores the impact of dysfunctional automatic and longer-term

cognitive processes (negative cognitive appraisals and negative thinking styles)

and the impact of adaptive automatic and longer-term cognitive processes

(positive cognitive appraisals and positive thinking styles) on whether students

find meaning in their university lives.

Cognitive appraisal is the automatic cognitive process through which individuals evaluate why an event occurred, whether it is threatening and controllable and its implications for their future (Park, 2010; Smith & Lazarus, 1993). These appraisals can either be dysfunctional in nature (generate intense negative emotions) or adaptive in nature (generate positive emotions). Negative thinking styles (dysfunctional longer term cognitive processes) are defined as a prolonged focus on the negative aspects of one's experiences, oneself, one's concerns, one's future and one's life (Fresco, Frankel, Mennin, Turk & Heimberg, 2002; Harris, Pepper & Maack, 2008; Kocovski, Endler, Rector & Flett, 2005; Molina, Borkovec, Peasley & Person, 1998; Nolen-Hoeksema, Wisco & Lyubomirsky, 2008; Segerstrom et al., 2003; Watkins & Teasdale, 2004; Watkins, 2008). Positive thinking styles (adaptive longer term cognitive processes) refer to the predisposition to habitually focus on positive aspects of one's life, experiences and future (Segerstrom et al., 2003; Watkins, 2008).

Cantor (1990) called for such research into the cognitive factors influencing resilience. However, in particular, she argued that studies were needed which explored the cognitive processes through which personality traits impact individuals' levels of resilience. She cited this gap in the literature as primordial. For her, although a great deal of research had explored the various personality traits influencing resilience, very little emphasis had been paid to understanding how these traits exert their impact. She claimed that due to the lack of such empirical work, an exhaustive list of personality traits had been highlighted without a clear understanding of the mechanisms involved. Consequently, the current research attempts to fill this void by examining the roles played by adaptive (positive) and maladaptive (negative) cognitive factors on the

relationship between a specific personality trait and resilience. The personality trait chosen was negative trait emotion.

Negative trait emotion refers to the dispositional tendency for individuals to experience intense, frequent and prolonged periods of negative emotion (Rosenberg, 1998). This personality trait was selected because researchers have consistently linked high negative trait emotion to difficulties in adjustment. For instance, possessing high levels of negative trait emotion has been labelled as a vulnerability factor for the development of affective pathology (Erwin, Heimberg, Schneier & Liebowitz, 2003; Elswood, Wolitzky-Taylor & Olatunji, 2012). One particular example of this is seen with Hazebroek, Howells and Day (2001, p. 32) who described high negative trait emotion as "a precondition for consideration for clinical intervention". In line with these arguments, students high on negative trait emotion should have difficulties adjusting to their experiences. As such, within this thesis, the cognitive processes that influence student adjustment were identified by assessing students with high levels of negative trait emotion, specifically exploring patterns in their cognitive processes that impact their levels of resilience.

Given the few studies that exist in this field, the current chapter will provide a brief review of empirical work which has been performed in populations adjusting to other life experiences. Its primary aim is to introduce the general framework which will subsequently be applied to examining adaptation among university students high on negative trait emotion. The review will begin by exploring the various theories of resilience before evaluating the relationship between high negative trait emotion, resilience and adjustment. It will then discuss the main factors which are postulated to influence individuals' resilience

while they are adapting to their life experiences - coping strategies, social support

and cognitive processes. Coping strategies refer to the methods individuals adopt

in order to deal with the experience (Campbell-Sills et al., 2006). Social support

refers to the presence of social and family relationships which can aid the

individual in handling the event (Rabkin, Remein, Williams & Katoff, 1993). This

aspect of the review will provide evidence which indicates that cognitive

processes, also referred to as cognition, may explain the impact of coping

strategies and social support on resilience. It will thus seek to justify the

importance of exploring the impact of cognition on student adaptation.

The following section will introduce the cognitive processes being

evaluated in this thesis – automatic cognitive appraisals, thinking styles and

meaning making. Researchers claim that these three processes may interact to

influence resilience in one of three ways:

(1) automatic negative cognitive appraisals trigger the meaning making

process. Individuals' capacity to complete the meaning making process

(find meaning) is positively influenced by their adaptive (positive)

thinking patterns.

(2) biases in automatic negative cognitive appraisals trigger intense negative

emotions. These intense emotions prevent individuals from finding

meaning.

(3) maladaptive (negative) thinking styles prevent individuals from

completing the meaning making process.

The review will present research into each of these options. Here, the main aim will be to analyse which of the three pathways may be responsible for the levels of resilience associated with high negative trait emotion. It will also highlight the areas within each pathway which are in need of further exploration. The final section will evaluate the relationship between negative trait emotion and each of these pathways, again highlighting the most potent of the three. It will also indicate the areas which warrant additional investigation before the main analysis.

1.1. Theories of resilience

The resilient biological profile was developed in 2004 by Charney. Charney recognized the mediating role neurochemicals play in how an individual responds to reward and motivation under chronic stress and extreme fear thus influencing how adaptive social behaviours develop. He believed that these mechanisms rendered an individual biologically resistant. For example, anhedonia and hopelessness have been put forth as the direct result of dopamine activity, and Charney claimed that resilient individuals essentially have a system that is hypersensitive to reward so that acute and chronic stressors fail to influence the rate at which dopamine is released.

However, although Charney's psychobiological model represented a major advancement in terms of biological explanations of resilience, he still failed to acknowledge the impact of environmental factors and personality traits on bodily reactions to stress. According to Cichetti & Walker (2001), such factors may cause the wide variety of biological reactions experienced by individuals in response to stressors. In fact, the authors describe a psychological reaction as the "initial link in a chain of events that leads to a biological stress" (p. 413). Garmezy, Masten and Tellegen (1984) categorised the mainstream psychological

resilience research trends into three main schools of thought, differing in the way they define resilience and thus the methodologies adopted in investigating the multifaceted concept.

'Personality resilience' represents the first school of thought. Here adversity is seen as decreasing levels of competence while resilient characteristics function independently yet additively to combat their negative effects. The majority of this earlier research focused on developing the 'resilient profile' through examinations of child populations, eventually leading to two major models of personality which continue to be implicated in emotional and behavioural problems among children.

The first of these profiles involves dichotomy of ego control and ego resiliency. These assess resilience by measuring individuals in terms of their ability to express or modulate their impulses respectively (Block & Block, 1980). In this case, resilience is evidenced by high levels of ego resiliency with such persons described as "resourceful and flexible (with the ability to)...adjust to changes in the environment quickly and recover quickly from stress" (Kwok, Hughes & Luo, 1996, p. 63). The second of these profiles is the Five Factor model of personality which espouses a resilient profile characterized by high scores on extraversion, agreeableness and conscientiousness and low levels of neuroticism (John, 1990). For these researchers, the resilient individual exhibits a range of positive behaviours including sociability, social adaptability, dependability, and a will to achieve (Huey & Weisz, 1997).

Studies have suggested underlying similarities between the two measures, providing evidence in support of the theory of 'personality resilience'. Kwok, et al. (2006) investigated the impact of ego resiliency, agreeableness and

conscientiousness among first grade students and successfully predicted
concurrent and future academic achievement. However, the validity of the
emergent relationship between traits and positive outcomes is undermined by the
failure of the theory to acknowledge the impact of context (Gore & Eckenrode,
2006). For example, Kwok et al. (2006) failed to evaluate the influence of the
characteristics specific to the classroom from which the information had been
gathered, such as teacher's behaviour. Hunter and Chandler (1999) highlighted
the impact of the environment and the teacher in particular in their investigations
into adolescent resilience. Individuals within their sample adopted more 'healthy'
resilient behaviours in place of the previous defence tactics of isolation and
disconnecting when teachers became more interactive. Therefore, the failure to
acknowledge the impact of environmental context is a major criticism launched at
the 'personality resilience' field.

This led to the development of research into protective factors. Here, studies
attempt to incorporate person-environment interactions by identifying both
internal and external features pertinent to resilient outcomes. Within this area of
research, these characteristics are seen as buffering the effects of high risk
backgrounds on the individual's ability to function effectively. Garmezy (1985)
classified a triad of protective factors: personality features; the presence of family
cohesion versus discord; and having positive external support systems. Rutter
(1985) similarly identified a combination of personality factors and strong
personal relationships among resilient children, and highlighted four major
processes through which these factors were having their effects: reducing the
impact of risk on the individual, reducing the probability that negative chain
events occur as a result of exposure to risk, ameliorating levels of self-esteem and

self-efficacy and providing the individual with novel and beneficial opportunities.

These factors have also emerged in more recent research. For instance,

developmental and biosocial theorists have identified a range of individual and

interactive influences on adjustment which involve genetic, environmental, social

and biological processes (Masten & Narayan, 2012; Granger & Kivlighan, 2003).

For instance, Granger and Kivlighan (2003) discussed the role played by parental

availability, function and support as well as gender and age in the wake of the

Buffalo Creek dam disaster of 1972 and the Australian busfire of 1983 and

Benson (2002) highlighting external support systems, family stability and internal

features as key in promoting resilience among younger populations

However, the protective factor theory has been criticized for its

methodological flaws. Gore and Eckenrode emphasize the inability of

investigations within this field to differentiate a protective factor from a risk

factor. One such example can be seen in the use of family cohesion within

empirical work. Tiet, Huizinga and Byrnes (2010) cite family cohesion as a key

protective factor at work in promoting adaptation among youth in high risk

neighbourhoods. However, in exploring adolescent resiliency, Ferguson and

Lynskey (1996) utilize high levels of family adversity to differentiate at-risk

adolescents. As such, within this branch of research, the criteria used to determine

the exact nature of a factor - that is, whether it is protective or whether its absence

can be viewed as a source of vulnerability - affects the validity of conclusions

drawn.

The weaknesses of the compensatory and protective factor models impact

upon their ability to efficiently be used to evaluate resilience. For instance,

research has highlighted inconsistencies in the behaviours and emotional status of

persons deemed resilient according to the specifications of the previous schools of thought. For instance, Luthar, Doernberger and Zigler (1993) reported that 'survivors' described high levels of emotional distress, such as depression and anxiety, which significantly increased over 6 months in spite of apparent successful coping. Longitudinal research has also hinted at the presence of emotional disturbance among adults who previously boasted high levels of resilience as children, with Higgins (1994) further defining these persons as socially and emotionally maladaptive in adulthood. Studies of resilience in female adult populations have also unveiled this dichotomy with behavioural resilience not necessarily denoting an absence of internal distress (O'Leary, Ickovics & Ryan, 1992). As such, resilience as it is explored within these schools of thought seems flawed.

Hence, studies focused on differentiating protective factors or determining the resilient profile based on personality characteristics seem to inaccurately define resilience as an immunity to periods of distress. However, the role of periods of disruption in promoting resilience is central within more recent resilience research (Richardson, 2002). Here, researchers focus on resilience as a process whereby individuals progressively develop the ability to successfully adapt or 'bounce back' from adversity (Flach, 1990; Fine, 1991; Richardson, 2002).

Rutter (1985, 1989) was the first to highlight the need to study resilience as a process. Rutter argued that unpleasant and potentially harmful experiences may protect the individual, 'toughening' them against future stressors, or may render the person more susceptible to later stress experiences. Rutter's theory focused on the effects derived from controlled exposure to a stressor. Such inoculation is not

always possible when confronted with typical life stressors; adversity often occurs

in an unpredictable and unavoidable manner. However, his postulations have been

validated in empirical work. For instance, according to Seery, Holman and Silver

(2010, p. 1038), exposure to moderate levels of stress over the lifespan led to the

development of "adversarial growth" characterised by "higher levels of

psychological functioning and well-being than previously experienced" among

their sample of elderly individuals, compared to those who experienced little

stress and those whose life had been plagued with many stressful experiences.

Increasingly, more and more research has since attempted to explore the

process through which the 'steeling' and sensitizing effects operate in individuals'

lives. Within this branch of enquiry, resilience is conceptualized not as

'invulnerability' in the face of adversity, but rather a multifaceted concept that

varies from individual to individual and across the life span as persons attempt to

"traverse the traumas of life in ways that work for them" (Hunter & Chandler,

1999, p. 244). A more subjective analysis of resilience is involved, aimed not at

quantifying risk and establishing social and emotional competences, but rather

understanding how persons interpret life stressors, dealing with the psychological

consequences in a manner that renders them either more or less capable to survive

any future stressors that they may encounter. Researchers within this field have

explored adjustment by evaluating how typical individuals adapt to positive life

experiences such as entering university, getting married and having children as

well as adverse life events such as childhood abuse and recent illnesses or injuries

(Bauer & McAdams, 2004; Bower et al., 1998; Brown & Trost, 2003; Campbell-

Sills et al., 2003; Dyson & Renk, 2006). They argue that in response to these

experiences, individuals with high levels of resilience adjust without much effort

(Richardson, 2002).

Those who fail to adjust are categorized into two groups. The first group

comprises individuals who gradually develop higher levels of resilience by

progressing through the resilience process. The resilience process incorporates "a

cycle of disruption and reintegration" (Fine, 1991, p. 458). "Disruption" is a

temporary phase of emotional and behavioural instability experienced in the

immediate aftermath of the event (Flach, 1990; Richardson, 2002). However,

eventually, individuals within this first group are able to enter into the

"reintegration" stage at which point, they develop higher levels of resilience and

positively adapt to the experience (Fine, 1991; Flach, 1990; Richardson, 2002).

The second group consists of individuals who, despite the passage of time,

remain unable to develop higher levels of resilience. According to researchers

(Flach, 1990; Richardson, 2002), these individuals fail to "reintegrate" and

become "stuck" in the disruption phase. As a result, these persons have problems

adapting to the triggering event, exhibiting instability which intensifies over time,

leading to poor adjustment to the experience (Flach, 1990; Horowitz & Solomon,

1975; Strain & Friedman, 2011).

1.2. Negative trait emotion, resilience and adjusting to life experiences

Research has explored the impact of negative trait emotion on adjustment

by evaluating trait anger, trait anxiety and trait depression. Trait anger refers to

the disposition to experience intense, frequent and prolonged anger (Cornell,

Peterson & Richards, 1999; Spielberger, Krasner & Solomon, 1988; Spielberger

& Sydeman, 1994). Individuals high on trait anxiety are described as possessing

the relatively stable tendency to experience intense, frequent and prolonged

anxiety (Spielberger & Sydeman, 1994). Trait depression is conceptualized as the

inclination to experience intense, frequent and prolonged sadness or depression

(Moosbrugger & Schermelleh-Engel, 1991).

Empirical work suggests that possessing high levels of any of these three

negative trait emotions may harmfully influence an individuals' capacity to adjust

to their experiences. For instance, research has found that persons diagnosed with

social anxiety disorder report significantly higher levels of trait anger (Erwin, et

al., 2003). Studies have also highlighted trait anxiety as "a vulnerability factor

for…the development of anxious pathology" (Elswood et al., 2012, p. 647). In

addition, findings have shown that trait depression is a premorbid risk factor for

persistent depression (Moosbrugger & Schermelleh-Engel, 1991) and is related to

an increased likelihood of delinquency following victimization (Manasse &

Ganem, 2009).

Researchers attribute this relationship specifically to high negative trait

emotion causing individuals to become stuck in the "disruption" phase of the

resilience process (Tarfrate, Kassinove & Dundin, 2002). Tarfrate et al. (2002)

evaluated the anger experiences of 93 adults within an American community.

They found that participants high on trait anger had significantly more intense

angry feelings than those low on trait anger. Furthermore, high trait anger

participants stated that their feelings triggered yelling, screaming, arguing,

threatening, making sarcastic, abusive remarks and physical aggression. This

resembles the emotional and behavioural chaos described as characteristic of

disruption (Flach, 1990; Richardson, 2002). In addition, these persons reported

that they remained in this disruptive state for an extended period of time. This

14

parallels the delayed disruption phase described above. These findings suggest that students with high negative trait emotion may be more likely to get stuck in disruption and because of this they may not develop the higher levels of resilience necessary for adjustment.

1.3.   Coping strategies, social support, cognition and resilience

Research investigating resilience as a process emphasize the important role played by cognitive processes. For instance, according to Lazarus (1991), the consequences of an experience are not caused by the event itself. He argues that nothing is inherently stressful; the determining factor is how it has been perceived by the individual: "any stimulus, no matter how noxious or unpleasant, can be viewed as either desired, interesting, non-threatening or non-harmful and, if it is so appraised, it will not be considered a stressor" (p. 3). In similar trend, Fine (1991) claims that the quality of individuals' emerging functional capacities following tribulation is guided by how they perceive the world and thus come to interpret their ability to deal with the challenging situations they encounter. In fact, she describes personal perceptions of the experience as having a greater impact than the situation itself.

Nonetheless, in addition to cognition, various other factors have been implicated as primordial for individuals' resilience as they adjust to their life experiences. Coping strategies and social support have been highlighted among these (Blalock & Joiner, 2000; Campbell-Sills et al., 2006; Hunter & Chandler, 1999; Palmer, 1997; Solomon, Berger & Ginzburg, 2007; Tiet & Huizinga, 2010). The following sections will examine the extent to which cognition influences the

relationship between coping strategies and resilience as well as between social

support and resilience respectively.

1.3.1.   Coping strategies, cognition and resilience

Theorists argue that higher levels of resilience emerge when individuals

engage in more "efficient" coping behaviours (Campbell-Sills et al., 2006;

Palmer, 1997). Efficient coping behaviours are described as task-oriented in

nature - focused on "managing or altering the problem causing the distress"

(Lazarus & Folkman, 1984, p. 150). The positive impact of task-oriented coping

on resilience has been validated by researchers (Campbell-Sills et al., 2006).

Campbell-Sills et al. (2006) highlighted the beneficial influence of task-oriented

coping on the levels of resilience of 132 United States undergraduates who had

experienced childhood neglect and abuse. They showed that participants who

engaged in task-oriented coping reported significantly higher levels of resilience

and lower levels of psychiatric distress. Their findings thus support the proposed

relationship between coping and resilience. However, confidence in the results is

limited based on the use of retrospective self-report to assess the presence of

childhood neglect and abuse. In addition, the cross-sectional nature of the

assessment hinders the ability to draw any causal conclusions.

The impact of coping on resilience is further called into question by studies

showing that less efficient coping strategies may not always be related to poor

adjustment. For instance, an increased use of avoidance coping, which involves

"avoiding cues and situations associated with the stressful stimuli" (Solomon et

al., 2007, p. 65), has been described as less efficient coping. However, research

has linked avoidance coping to adaptive functioning (Blalock & Joiner, 2000;

Solomon et al., 2007). Solomon et al. (2007) explored the impact of avoidance

coping within a group of 87 male Israeli body handlers – volunteers who collect

and evacuate dead bodies of victims during the Israeli-Palestinian conflicts. The

researchers found that participants' levels of post-traumatic stress disorder

(PTSD) were not significantly related to their use of avoidance coping. These

results contradict the proposed negative influence of less efficient coping on

adjustment. However, the findings may be attributed to the fact that few body

handlers qualified for a diagnosis of PTSD (only 2% in the sample). Therefore, it

can be argued that this study may not represent a valid assessment of the impact

of avoidance coping on individuals' capacity to adjust to their experiences.

Nonetheless, additional research suggests that a third variable – cognition –

may explain the impact of coping on resilience (Blalock & Joiner, 2000; Palmer,

1997). For instance, in her exploration of the relationship between resilience,

coping and cognition among adult children of alcoholic parents (ACOAs), Palmer

suggested that the capacity of the ACOAs within her sample to engage in efficient

coping may have been negatively impacted by their "destructive cognitions"

(Palmer, 1997, p. 203). This can be seen in her discussion of one of the

participants - Chance. Palmer classified Chance as having lower levels of

resilience since his life was marked by a constant state of loss and alcohol abuse.

She further noted that, unlike those with higher resilience, Chance engaged in

destructive cognitions. For instance, he described himself as a "lost soul" (Palmer,

1997, p. 75). Palmer highlighted this thinking as preventing Chance from

searching out and using more efficient coping strategies. As such, she suggests

that cognition plays an important role in the coping strategies individuals adopt as

they attempt to adapt to their experiences. It can be argued that, in spite of the in-

depth interviews on which her postulations were based, confidence in the results is limited by the cross-sectional nature of her analysis and her small sample size (10 ACOAs). However, her findings align with those of other researchers (Blalock & Joiner, 2000; Solomon et al., 2007). Therefore, empirical work hints that individuals' capacity to adjust may rely more heavily on their cognitions than on the coping strategies they use.

1.3.2. Social support, cognition and resilience

Researchers claim that social support also helps individuals to develop higher levels of resilience (Hunter & Chandler, 1999; Tiet & Huizinga, 2010). For instance, Hunter and Chandler (1999) suggested that increased social support was responsible for improved resilience among 51 inner city United States adolescents. These adolescents were exhibiting maladaptive functioning such as isolation and emotional distancing. However, by strengthening their sense of social support through focus group work with teachers, the researchers found improvements in students' behaviour and academic performance. They thus argued that the amount of social support provided to the students exerted an important influence on their levels of resilience. The qualitative and quantitative methods used increase the validity of the results obtained and boost confidence in their postulations. However, the study did not directly assess the presence or absence of social support and hence failed to directly evaluate whether the improvements that they observed were caused by changes in students' social support systems.

Furthermore, additional research suggests that the impact of social support on resilience may be influenced by cognition (Rutter, 1985; 1987; Tiet &

Huizinga, 2010). For instance, Tiet and Huizinga (2010) explored the predictors

of resilience among 877 adolescents from socially disadvantaged high crime

neighbourhoods in the Denver metropolitan area. The influence of social support

was assessed by evaluating family and teacher relationships. Data were collected

over a one-year period. Confidence in the findings is thus increased by the

longitudinal design of the study and the substantial sample size. The researchers

found that although parental monitoring and strong bonding to teachers

influenced students' levels of resilience, parental monitoring exerted a negative

impact. These findings suggested that the influence of social support may not

depend on it being present but rather its impact relied on how individuals

regarded the type of support provided. Similar arguments have been put forth by

other theorists (Brodsky, 1999; Rutter, 1985; 1987; 2007). Therefore, evidence

indicates that individuals' capacity to adapt may rely more heavily on their

cognitions than on the mere presence of social support systems.

1.4. Types of cognition and resilience

Researchers describe three main cognitive processes as impacting

individuals' levels of resilience. These include: (1) automatic cognitive appraisals,

(2) longer term thinking patterns (thinking styles) and (3) meaning making

(Berry, Worthington, O'Connor, Parrott III & Wade, 2005; Hazebroek et al.,

2001; Hudley & Graham, 1993; Nolen-Hoeksema & Morrow, 1991; Raes, 2010;

Smith & Alloy, 2009). They assert that these three processes interact to exert their

influence. The review will begin by describing how they are postulated to interact

for the development of higher levels of resilience. It will then compare the two

ways in which they are purported to interact in cases where higher levels of resilience are difficult to develop.

1.4.1. Cognition and higher levels of resilience

Researchers assert that higher levels of resilience emerge as a result of two interactions. Primarily, automatic negative cognitive appraisals generate the meaning making process (Folkman & Moskowitz, 2000; Horowitz, 1975; Tedeschi & Calhoun, 2004) while positive thinking patterns help individuals to complete the meaning making process that has been triggered (Borkovec et al., 1998; Segerstrom et al., 2000; Segerstrom et al., 2003; Watkins, 2008).

1.4.1.1. Cognitive appraisals, meaning making and higher levels of resilience

Investigators suggest that the cognitive appraisal process comprises two consecutive phases (Folkman & Moskowitz, 2000; Lazarus & Folkman, 1984). Firstly, individuals engage in primary appraisal where they assess the event in terms of its risk to their well-being. Then they perform secondary appraisals in which they identify potential coping strategies and consider the likelihood that these strategies will succeed and whether these strategies can be applied effectively (Folkman & Moskowitz, 2000; Lazarus & Folkman, 1984). Negative cognitive appraisals occur when individuals encounter an experience whose demands are evaluated as outweighing their available coping resources. These appraisals generate negative emotions. According to researchers, these negative emotions are of extreme importance to the resilience process as they trigger meaning making (Folkman & Moskowitz, 2000; Horowitz, 1975; Tedeschi & Calhoun, 2004).

Researchers state that higher levels of resilience result from completing the meaning making process (Bower et al., 1998; Davis & Morgan, 2008; Michael & Snyder, 2005; Park, 2010; Salsman et al., 2009; Updegraff et al., 2008). This thesis proposes that completing the meaning making process entails finding two forms of meaning –"meaning as comprehensibility" and "meaning as significance" (Bower et al., 1998; Davis et al., 1998; Davis & Morgan, 2008; Holland, Currier & Neimeyer, 2006; Janoff-Bulman & Frantz, 1994; Schok, Kleber & Lensvelt-Mulders, 2010). Discovering meaning as comprehensibility, also referred to as "making sense" of the event, involves "creating a cognitive framework to explain the experience" (Schok et al., 2010, p. 331). These meanings tend to be centred on themes such as trust, fatalism and spirituality/faith (Davis, Nolen-Hoeksema & Larson, 1998; Pakenham, Sofronoff & Samios, 2004; Schok et al., 2010). On the other hand, discovering meaning as significance, also referred to as "finding benefit" in the experience, involves determining how the event has brought worth or value to one's life. These meanings typically involve themes such as deriving an uplifting or positive understanding of oneself or one's relationships and the development of personal skills (Davis et al., 1998; Pakenham et al., 2004; Schok et al., 2010).

However, researchers debate the relationship between these two forms of meaning making and adjustment (Bower et al., 1998; Davis et al., 1998; Davis & Morgan, 2008; Schok et al., 2010). On the one hand, some findings suggest that discovering meaning as comprehensibility aids individuals in their adjustment (Holland et al., 2006; Pakenham et al., 2004; Updegraff et al., 2008). For example, Updegraff et al. (2008) found that having made sense of the September 11 attacks significantly reduced the levels of post traumatic stress (PTS)

symptoms among 931 United States adults. The researchers controlled for potential confounding variables such as exposure to the attacks, acute stress symptoms and pre-9/11 mental health status, thus adding confidence to the results obtained. Furthermore, the study was longitudinal in nature, with data being collected at 1- and 2-year intervals enabling some understanding of cause and effect. The relationship between having made sense of the attacks and reduced PTS symptoms emerged at both time intervals. These findings suggest that discovering meaning as comprehensibility may be linked to higher levels of resilience.

On the other hand, empirical findings hint that it is discovering meaning as significance, not discovering meaning as comprehensibility, which exerts a positive impact on adjustment (Davis et al., 1998; Michael & Snyder, 2005). For instance, Davis et al. (1998) compared the role of the two forms of meaning making among 205 adults coping with the death of a hospice-residing family member. Data were collected over an 18-month period: at 6 months post loss, 13 months post loss and 18 months post loss. Discovering meaning as comprehensibility was assessed by coding responses to the question "Do you feel you have been able to make sense of the death" in "yes", "no" or "ambiguous or partly" categories. Discovering meaning as significance was assessed by coding responses to the question "Have you found anything positive in this experience" into the same categories. Inter-rater agreement ranged between 0.85 and 0.90 for all data collected, adding confidence to the findings. The results indicated that at 6 months, both forms of meaning exerted a significant positive impact on participants' levels of resilience. This suggests that both forms of meaning may be important to resilience. However, at 13 months and 18 months, controlling for

pre-loss distress and whether or not either form of meaning had been previously found, individuals' improvements in psychological distress were no longer related to discovering meaning as comprehensibility. They only remained significantly positively related to discovering meaning as significance. The researchers therefore argued that discovering meaning as significance may play a more robust role in adjustment.

Conversely, discovering meaning as significance has also been linked to poor adjustment (Michael & Snyder, 2005). Michael and Snyder (2005) examined the impact of both forms of meaning on adjustment within a sample add 158 bereaved American college undergraduates. The researchers found that among students who had experienced the loss over a year prior to data collection (124 students within the sample), finding benefit in the death was significantly positively related to higher levels of distress. Confidence in the findings are increased based on the high reliabilities of the measures used within the study (all alphas < 0.79) and the use of a Bonferroni correction which reduced the possibility of Type I error. These discrepant outcomes therefore suggest that a more complex relationship may exist between the two forms of finding meaning and adjustment.

Holland et al. (2006) subsequently argued that adjustment may emerge from an interaction between the two forms of meaning. The researchers examined 1,022 recently bereaved college undergraduates within an American university. The Inventory of Complicated Grief (ICG; Preigerson et al., 1995) used to evaluate adjustment has high internal reliability (0.94) and good temporal reliability (0.92). The large sample size and the measures used thus add

confidence to the findings. Multiple regression analyses revealed that having made sense of the loss and finding some benefit in the loss interacted to significantly negatively influence students' ICG scores. These findings suggest that individuals' adjustment may be influenced by them finding both forms of meaning, that is, making sense of the experience and finding some benefit in the event. They therefore provide some support for the relationship between adjustment and the meaning making process being put forth in this thesis; a process that entails two consecutive stages: (1) discovering meaning as comprehensibility and (2) discovering meaning as significance (Davis et al., 1998; Park, 2010).

Researchers assert that finding meaning generates higher levels of resilience through an interaction with positive thinking patterns (Fredrickson, 2001). Fredrickson (2001) specifically argues that positive thinking styles generate the finding of meaning. This finding of meaning subsequently triggers positive emotions and these emotions further increase individuals' levels of positive thinking styles. She therefore links the development of resilience to the effect of a "reciprocal relationship between positive emotions, [positive] thinking and meaning (which)...over time...should accumulate and compound" (p. 9), implicating both positive automatic cognitive processes (which generate positive emotions) and positive thinking styles. In support of this, research has linked positive emotions to adjustment following a range of experiences such as the 9/11 attacks and laboratory stressors (Fredrickson & Branigan, 2005; Fredrickson, Tugade, Waugh & Larkin, 2003; Ong, Bergeman, Bisconti & Wallace, 2006; Tugade & Fredrickson, 2004). Therefore, findings suggest that higher levels of

resilience are generated by an interaction involving not only cognitive appraisals (both negative and positive) and finding meaning but also positive thinking styles.

1.4.1.2.   *Thinking styles, meaning making and higher levels of resilience*

As suggested by Fredrickson (2001), positive thinking styles have been found to strengthen individuals' capacity to adapt to their experiences by enabling them to discover meaning (Carver et al., 1993; Litt et al., 1992; Schok et al., 2010). For instance, this has emerged in research into optimistic thinking. Optimistic thinking is a form of positive thinking which refers to the "generalized tendency to expect positive outcomes in the face of obstacles" (Scheier & Carver, 1985, as cited in Karademas, 2006, p. 1282).

In their evaluation of 1,561 veterans, Schok et al. (2010) linked optimistic thinking to finding meaning. These researchers examined the relationship between optimism and both forms of meaning within their sample. Discovering meaning as comprehensibility was assessed by evaluating the extent to which: (1) veterans distrusted and felt detached from people and their surroundings and (2) veterans followed a religion. Discovering meaning as significance was assessed by evaluating: (i) veterans' level of growth or learning following the experience and (ii) the total number out of 17 potential benefits that they gained from the event. The correlations revealed that optimism was significantly negatively related to both measures of discovering meaning as comprehensibility but significantly positively related to the measures of discovering meaning as significance. The results provide some support for a positive relationship between

optimistic thinking and finding meaning: higher levels of optimistic thinking were related to discovering meaning as significance.

However, the negative correlations seem to contradict the two-stage meaning making process previously proposed. The thesis argues that optimistic thinking aids individuals to complete the meaning making process and discovering meaning as comprehensibility is the first stage of this two-stage meaning making process. Therefore, in line with these assertions, discovering meaning as comprehensibility should have been positively related to optimism, and not negatively related as the findings showed. However, it can be argued that these negative correlations were due to the limited measures used to assess discovering meaning as comprehensibility compared to discovering meaning as significance within the study. In qualitative explorations of types of meaning within both categories, researchers have highlighted more than five types of both forms of meaning (Davis et al., 1998; Pakenham et al., 2004). Therefore, the use of two subscales to assess discovering meaning as comprehensibility while 18 items were used to assess discovering meaning as significance may have limited the analysis for the former category. As such, further research is needed to substantiate whether positive thinking styles aid individuals in completing the proposed two-stage meaning making process and thus help them to develop higher levels of resilience.

1.4.2. Cognition and difficulties developing higher levels of resilience

Research suggests that some individuals fail to adapt to their experiences because they are unable to complete the meaning making process (Davis et al., 1998; Davis & Morgan, 200; Flach, 1990; Richardson, 2002; Updegraff et al., 2004). This may happen in one of two ways. On the one hand, individuals can

become stuck in the "disruption phase", also referred to by researchers as the

"intrusion" phase, which occurs in the immediate aftermath of the event

(Horowitz, 1986; Salsman et al., 2009; Tedeschi & Calhoun, 2004). When

individuals become stuck in this phase, they fail to begin the search for meaning.

On the other hand, persons can become stuck in the "reintegration" phase, also

referred to by researchers as the "working through" phase, during which meaning

as comprehensibility and meaning as significance are sought for and discovered

(Salsman et al., 2009; Schok et al., 2010). When individuals become stuck in this

phase, they may begin the search for meaning but are unable to complete it. The

following sections will introduce the two phases and then discuss the cognitive

processes implicated in becoming stuck in each of these.

1.4.2.1.   The intrusion phase

The intrusion phase is characterised by cognitive intrusions – "thoughts

[that]...intrude into awareness, taking the form of unbidden images or ideas,

feelings that the individual has difficulty controlling, or some symbolic

behavioural re-enactment of...[the] event" (Clark, 1996, p. 67). The symptoms

typical within this phase also include feelings of being pressured, confused or

disorganised when thinking about themes related to the event; preoccupation with

themes related to the event, with the inability to concentrate on other topics; and

emotional "pangs" or "attacks" of affect related to the event (Horowitz, 1986).

Researchers assert that the intrusion phase is extremely distressing in

nature (Horowitz, 1975; Kelly, 1955) and link prolonged intrusion phases, also

referred to as "delayed stress response syndromes", to poor adaptation (Horowitz

& Solomon, 1975; Salsman et al., 2009; Strain & Friedman, 2011). For instance,

Salsman et al. (2009) associated prolonged cognitive intrusions to poor adjustment to living with cancer. Their participants were 76 colorectal cancer survivors in Kentucky, United States who were assessed over a three month period. The longitudinal nature of the study thus enables some understanding of cause and effect. It was found that poor adaptation, assessed by determining the frequency of participants' post-traumatic stress disorder (PTSD) symptoms, was best predicted by higher levels of cognitive intrusions both at baseline and at 3 months. These results suggest that difficulties in adaptation may result from the intrusion phase being prolonged following the experience.

1.4.2.2.   *The working through phase*

The working through phase is characterised by more effortful and constructive contemplation (Horowitz, 1986; Salsman et al., 2009). According to researchers, it is in this working through phase that individuals commence and complete their search for the meaning of the experience (Horowitz, 1986; Salsman et al., 2009). As discussed above, research suggests that completing the meaning making process involves the discovery of meaning as comprehensibility and the discovery of meaning as significance (Holland et al., 2006; Janoff-Bulman & Frantz, 1994; Park, 2010). The working through phase is thus conceptualised as comprising two sub-stages: (1) the search for and discovery of meaning as comprehensibility and (2) the search for and discovery of meaning as significance (Janoff-Bulman & Frantz, 1994; Park, 2010).

The search for meaning as comprehensibility represents the first sub-stage. According to researchers, within this sub-stage, the experience is contrasted against the life values, core assumptions and goals of the individuals' schema in

order to identify an acceptable reason for the event's occurrence (Davis &

Morgan, 2008; Horowitz, 1986; Moos & Schaefer, 1986; Paton & Smith, 1996;

Dunning, 2003; Updegraff et al., 2008). For them, individuals within this phase

essentially seek an answer to the question "why me?". The initial stages of the

search for comprehensibility are described as distressing in nature. For instance,

during this sub-stage, theorists assert that persons may primarily feel "off course":

their lives may seem futile as they consider "what's wrong with the world....[and]

what's wrong with them" (Dalton & Dunnett, 2005, p. 50). However, as

individuals progress through the search, their levels of distress gradually fade.

This sub-stage is considered complete when individuals have discovered meaning

as comprehensibility and shifted into the search for significance (Janoff-Bulman

& Frantz, 1994; Park, 2010).

The search for meaning as significance represents the second sub-stage.

Researchers claim that this sub-stage involves attempts to determine the worth of

the event and focuses on answering "what can the event teach me?" (Taylor,

1983; Moos & Schaefer, 1986; Janoff-Bulman & McPherson, 1997; Davis et al.,

1998; Michael & Snyder, 2005). Individuals can complete this phase by

discovering meaning as significance in one of many ways. For instance, they may

make downward comparisons with less fortunate others, manufacture hypothetical

worse scenarios so that they feel relative advantages, or focus on the positive

attributes of the experience such as personal happiness and fulfilment (Folkman,

1997; McLean & Thorne, 2003; McLean, 2005; Singer, 2004). When individuals

have discovered the significance of their experiences, they are said to have

completed the meaning making process (Janoff-Bulman & Frantz, 1994; Park,

2010).

Research has associated becoming stuck in this working through phase, specifically becoming stuck in the search for comprehensibility, with poor adjustment (Davis & Morgan, 2008; Updegraff et al., 2008). For instance, Davis and Morgan (2008) explored the impact of discovering meaning as comprehensibility among a group of 315 tinnitus sufferers. Tinnitus is characterised by chronic pain due to "the perception of sound in the ears or head in the absence of external stimuli" (p. 128). The researchers compared participants who had made sense of their condition to those who had not on measures of depression and well-being. These measures included a 10-item version of the Center for Epidemiological Studies Depression (CES-D) scale adapted by Kohout, Berkman, Evans and Cornoni-Huntley (1993) from the original by Radloff (1977) and a 14- item scale developed by Ryff and Keyes (1995) which incorporated a multidimensional assessment of well-being, exploring areas such as Personal Growth, Purpose of Life and Self-Acceptance. These measures had been validated in previous research and also had good levels of reliability, adding to the confidence that could be placed in the study's findings.

The results showed that those who were still engaged in the search for comprehensibility (had more frequently asked themselves "why me?" in the past two weeks) reported significantly higher levels of depression than others within the sample. These findings suggested that a prolonged search for meaning as comprehensibility negatively influenced participants' capacity to adjust to having tinnitus. Although reliability statistics for the measure used to assess finding meaning are not reported, confidence in the results remains since similar measures have been shown to be valid in longitudinal studies (Davis et al., 1998;

Updegraff et al., 2008). The findings thus substantiate the negative influence that a prolonged search for comprehensibility can have on individuals' adjustment to their life experiences.

1.4.2.3.   Cognition and getting stuck in the intrusion phase

Researchers suggest that individuals get stuck in the intrusion phase when they experience extremely intense negative emotions following the event (Flach, 1990; Richardson, 2002; Tedeschi & Calhoun, 2004). According to Richardson (2002), if individuals possess the levels of resilience critical to dealing with the demands of the situation, they do not actually experience these intense emotions. For him, such emotions result only when individuals' levels of resilience are insufficient. He specifically discusses the influence of resilient cognitive processes, but does not detail how these exert their impact.

However, additional research has considered the relationship between cognitive processes and intense negative emotions. Evidence was first put forth as early as1955 within the Personal Construct Theory of George Kelly. According to Kelly, the intensity of emotions triggered by an experience depends on the impact that the specific experience has had on an individual's personal construct system; the cognitive (schema) system which holds their views about the self and the world (Kelly, 1955). For Kelly, these constructs essentially allow anticipation of events and it is confidence in their predictive accuracy that enables individuals to interact with their environment.

When events invalidate these predictions, Kelly claimed that one in two things can occur. In some cases, he argued that the construct system is sound and thus enables individuals to eventually discern the most effective way to respond

to the situation and subsequently adjust to the event (Bannister, 1962; Lester, 2009). In other cases, however, Kelly acknowledged that intense negative emotions are triggered which prevent adjustment. For him, this occurs when the experience severely invalidates individuals' internal schemas (irreversibly violates their expectations and hinders their capacity to eventually choose effective responses). These intense negative emotions signal that schematic revision is needed to resolve discrepancies between the new information (details of the experience) and the existing personal construct system. Without such resolution, the individual has no appropriate manner of responding, and thus is likely to adjust poorly to the event. For instance, Kelly claimed that intense anxiety was triggered in instances when an individual's personal construct system can in no way be applied to the experience. For him, in these cases anxiety becomes extreme and chronic and leads to ineffective decisions, and subsequent poor adjustment (Lester, 2009).

Researchers have since further explored the cognitive processes through which a violation of individuals' schemas leads to intense negative emotions. They have, for instance, linked intense negative emotions to biases in individuals' automatic negative cognitive appraisals (Smith, Haynes, Lazarus & Pope, 1993; Smith & Lazarus, 1993). These investigators assert that each negative emotion results from specific patterns in negative cognitive appraisal. Table 1.1 details the cognitive appraisal components that they claim underlie each negative emotion. For them, intense negative emotions emerge when persons perform exaggerated appraisals within these components (Smith & Lazarus, 1993). For instance, as can be seen in Table 1.1, Smith and Lazarus (1993) argued that intense anger would emerge when persons are biased toward: (1) seeing the event as motivationally

relevant, that is, interpreting the experience as significantly relevant to their

interests, (2) seeing the event as motivationally incongruent, that is, interpreting

the experience as exerting a substantial negative impact on their interests and (3)

seeing the event as caused by another individual (other-accountability) (Smith et

al., 1993; Smith & Lazarus, 1993).

Table 1.1.

Appraisal components and the core relational themes associated with six

emotions

Emotion	Core relational theme	Appraisal components
Anger	Other blame	Motivationally relevant
		Motivationally incongruent
		Other accountability
Fear-anxiety	Danger-threat	Motivationally relevant
		Motivationally incongruent
		Low or uncertain (emotion-focused)
		coping potential
Sadness	Irrevocable loss	Motivationally relevant
	Helplessness about harm	Motivationally congruent
	or loss	Low problem-focused coping
		potential

Note. Adapted from "In Search of the *Hot* Cognitions: Attributions, Appraisals

and Their Relation to Emotion," by C. Smith, K. Haynes, R. Lazarus and L. Pope,

1993, *Journal of Personality and Social Psychology, 65,* p. 918. Copyright 1993

by the American Psychological Association.

Moosbrugger and Schermelleh-Engel's (1991) study validated this relationship between exaggerated appraisals and intense emotional reactions, supporting the proposed role played by these automatic cognitions in getting stuck in the intrusion phase. These researchers examined 103 individuals experiencing lower back or joint pain for 1 year or longer. Participants filled in measures assessing their perceived competence in handling pain and their levels of anxiety and depression triggered because of pain. Perceived competence aligns with the cognitive appraisal component of coping potential implicated in the fear-anxiety and sadness emotions (Table 1.1). The results showed that low perceived competence generated significantly higher levels of anxiety and depression. They thus substantiated the postulated relationship between biased patterns in automatic negative cognitive appraisal and intense negative emotional reactions. The findings were derived from cross-sectional analyses, limiting the causal inferences that can be made. However, additional studies incorporating experimental manipulation have supported the impact of automatic negative cognitive appraisals on negative emotion (Hazebroek et al., 2005). Therefore, empirical work suggests that intense negative emotions are related to biased/exaggerated negative cognitive appraisals.

It is postulated that intense negative emotions exert their impact on adjustment by preventing individuals from commencing the more in-depth thinking of the working through phase. In support of this, high levels of negative emotion have been shown to hinder processing and promote false memories (Baron, Inman, Kao & Logan, 1992; Brainerd, Stein, Sillveirs, Rohenkohl & Reyna, 2008). However, researchers argue that negative emotions do not convey individuals' levels of resilience (Hunter & Chandler, 1999; Rutter, 2007). For

instance, Rutter (2007) differentiated what occurs in the immediate aftermath of an experience from what constitutes resilience. He stated that although resilient and non-resilient individuals may both have similar automatic emotional responses to an experience, the former subsequently exhibits functional behaviour following the event (indicating that they have adjusted to its occurrence) while the latter does not (suggesting poor adjustment). In support of his arguments, empirical work has shown that individuals who experience intense negative emotional reactions nonetheless possess high levels of resilience (Ong et al., 2006; Tugade et al., 2004). As such, empirical findings suggest that negative cognitive appraisals may not be related to students' difficulties in developing higher levels of resilience and their capacity to adjust to their university experiences.

1.4.2.4.   Cognition and getting 'stuck' in the working through phase

Researchers assert that individuals may get stuck in the working through phase when they engage in negative thinking styles (Davis & Morgan, 2008; Ray et al., 2005; Robinson & Alloy, 2003). They claim that negative thinking styles are rigid and unchanging in nature and cause individuals to habitually focus on the negative impact that the event has had on their lives (Davis & Hoeksema, 2000; Lyubomirsky & Nolen-Hoeksema, 1995; Watkins & Teasdale, 2004). For instance, they may focus on the great degree of unwanted change to their lifestyle that the event has caused (Davis & Morgan, 2008; King & Raspin, 2004). As a result, these individuals are unable to discover meaning as comprehensibility and also to subsequently search for and discover meaning as significance.

In support of these claims, negative thinking styles have been linked to poor adjustment (Alloy, Abramson, Whitehouse, Hogan, Panzarella & Rose, 2006;

Borkovec et al., 1998; Calmes & Roberts, 2007; Harrington & Blankenship, 2002; Lyubomirsky & Nolen-Hoeksema, 1995; Nolen-Hoeksema, 2000; Robinson & Alloy, 2003). For instance, Rabkin et al. (1993) explored the cognitive patterns of 53 well-adjusted long-term survivors of AIDS living in New York City using qualitative interviews and a series of quantitative measures. The researchers found that, on average, their participants did not engage in significantly more negative thinking than the "norm" – the norm score was obtained from a sample of 400 individuals within the community (Greene, 1981). The participants also obtained the "norm" scores on the Global Assessment of Functioning Scale (GAF; American Psychiatric Association, 1987) and the Quality of Life Index (QLI; Spitzer et al., 1981). Confidence in the findings is increased by the researchers' use of lengthy semi-structured interviews and validated self-rating scales which provided a more well-rounded evaluation of their participants' functioning. The findings hinted that a negative relationship may exist between negative thinking and adjustment: participants' scores on the GAF and QLI suggested that they were well-adjusted and these participants were not more likely to engage in negative thinking. Although not directly assessed, the study's findings implied that negative thinking styles may have a harmful impact on individuals' resilience.

Researchers assert that negative thinking styles may exert this harmful influence by hampering individuals from searching for and discovering meaning as significance (Ray et al., 2005). This can be seen in investigations into worry and rumination. Worry and rumination represent two dimensions of negative thinking styles which have been widely investigated (Alloy et al., 2006; Borkovec et al.,1998; Calmes & Roberts, 2007; Harrington & Blankenship, 2002;

Lyubomirsky & Nolen-Hoeksema, 1995; Nolen-Hoeksema, 2000; Robinson & Alloy, 2003). Worry centres on real or imagined future negative events (Borkovec et; al., 1998; Nolen-Hoeksema et al., 2008). Rumination involves persons continuously thinking in an aversive manner about their past negative experiences; it may also include worrisome thoughts about potential negative future events (Kocovski & Rector, 2007; Nolen-Hoeksema et al., 2008; Roger, de Scremin, Borril & Forbes, 2011; Robinson & Alloy, 2003; Siegle, Moore & Thase, 2004).

Worry and rumination have been related to a prolonged working through phase. For instance, Borkovec et al. (1998) describe worry as a form of cognitive avoidance which distracts individuals by occupying their minds with the negative, superficial aspects of the event. They thus suggest that worry may prevent individuals from engaging in the positive reframing that occurs within the search for significance. In similar trend, rumination has been shown to hamper the successful discovery of meaning as significance (Ray et al., 2005). Ray et al. (2005) explored brain activation of "trait ruminators" - individuals who tend to "focus on negative aspects of themselves or negative interpretations of their lives" (p. 157); in other words, they habitually engage in rumination. The researchers sought to evaluate whether these individuals were deficient in brain activity within areas related to the capacity to positively reframe one's experiences, that is, to derive some benefit from events.

Their findings revealed that when trait ruminators had to positively reinterpret negative stimuli and therefore engage in benefit finding, they showed reduced brain activation in some of the areas of interest including the left

prefrontal cortex and the right amygdala. These results suggest that trait ruminators may differ in the extent to which they are capable of deriving benefit from their experiences. The use of experimental manipulation increases confidence in the cause-effect relationship that the researchers proposed: that negative thinking styles hamper individuals' ability to discover meaning as significance. This is further bolstered by additional studies which have associated activation in the prefrontal cortex with higher levels of resilience.

On the one hand, Jackson, Burghy, Hanna, Larson and Davidson (2000) and Jackson, Malmstadt, Larson and Davidson (2000) linked increased activation in the left prefrontal cortex to decreased responsiveness to stress – assessed by evaluating individuals' capacity to regulate their positive emotions. On the other hand, Urry et al. (2004) linked increased activation in the left prefrontal cortex to increased levels of well-being assessed using the Scales of Psychological Well Being (SPWB) developed by Ryff (1989). The Personal Growth subscale of the SPWB explores the extent to which an individual is changing in ways that reflect more self-knowledge and effectiveness. It therefore includes items reflective of resilience such as "I think it is important to have new experiences that challenge how you think about yourself and the world". The researchers found this scale was significantly correlated with levels of activation in the prefrontal cortex. These findings suggest that reduced activation in the left prefrontal cortex may negatively influence adjustment to life experiences and thus support the postulations that rumination may exert its impact by hindering benefit finding, as evidenced by decreased activity in the pre-frontal cortex.

However, the absence of reduced activation within the left amygdala in Ray et al.'s study sheds some doubt on their postulations. It can be argued that these contradictory findings may be due to characteristics of the participants used in the study - a small sample (24 individuals) consisting exclusively of females. For instance, increased activation in the left amygdala has been implicated in responses to anxiety-provoking situations (Phelps, O'Connor, Gatenby, Gore, Grillon & Davis, 2001) and with attempts to control the experience of such negative emotion over time (Schaefer, Jackson, Davidson, Kimberg & Thompson-Schill, 2000). Women have been found to be significantly more likely to experience anxiety (Armstrong & Khawaja, 2002; Rezazadeh & Tavakoli, 2009). Therefore, the absence of activation in the left amygdala may have been due to differences in how females experience particular negative emotions such as anxiety, and not to the absence of a relationship between rumination and finding meaning as significance. However, confidence in this argument is limited as the researchers made no differentiation between the types of negative emotions elicited by their stimuli. Instead, participants rated the pictures in terms of the levels of general negative affect elicited, thus the role played by anxious feelings cannot be isolated. As such, further research is warranted aimed at exploring the relationship between rumination and finding benefit and the impact of this relationship on individuals' levels of resilience.

The need for further research is also emphasised by the limited number of investigations into the impact of the various dimensions of negative thinking styles on adjustment (Berry et al., 2005; Davey, Howells & Day, 2005; Kocovski & Rector, 2007). For instance, a great deal of research into negative thinking tends to analyse the impact of depressive rumination (Calmes & Roberts, 2007;

Hong, 2007; Nolen-Hoeksema, 2000; Nolen-Hoeksema & Harrell; 2002).

Depressive rumination is a form of rumination which focuses on how the situation

could have been avoided (Greenberg, 1995; Nolen-Hoeksema, 1991). However, a

focus on depressive rumination ignores other pertinent dimensions of negative

thinking, such as anxious and angry ruminations. Anxious ruminations focus on

the potential for similar negative events in the future (Kocovski & Rector, 2007).

Angry or vengeful ruminations involve thoughts about interpersonal hurts and

offences, and fantasising about avenging a perceived injustice (Berry et al., 2005;

Davey et al., 2005). As studies typically fail to consider these additional

dimensions of negative thinking styles, more research is needed to confirm: (1)

that negative thinking styles generate a delayed search for meaning (working

through phase) and (2) that this relationship accounts for its harmful influence on

individuals' levels of resilience.

1.5. Negative trait emotion, cognition and resilience

The thesis' main aim is to identify which of the two aforementioned

pathways – a delayed intrusion phase or a prolonged working through phase – is

responsible for the difficulties in adjustment that are predicted among students

with high levels of negative trait emotion. The review will now explore research

which has studied the relationship between each pathway and negative trait

emotion.

1.5.1. Negative trait emotion and exaggerated cognitive appraisals

Rosenberg (1998) claimed that high levels of negative trait emotion were

associated with the exaggerated cognitive appraisals that were discussed in

Section 1.4.2.3. She stated that as a result of such biased negative cognitive

appraisals, individuals high on negative trait emotion more readily experienced

intense negative emotions in response to very little provocation. Rosenberg

(1998) additionally argued that these biases were trait congruent: they caused

individuals high on a specific negative trait emotion to be "primed" only for that

negative emotion at baseline (p. 250). Therefore, persons would more readily

respond to their experiences with intense levels of the specific negative emotion

for which they had this "reduced threshold" (Rosenberg, 1998, p. 250). For

instance, persons high on trait anger would be constantly primed for anger due to

their propensity toward automatic angry cognitive appraisals; they would thus

more readily respond to their experiences with intense angry feelings (Hazebroek

et al., 2001; Tarfrate et al., 2002; Wilkowski & Robinson, 2008). This is referred

to as the trait-congruent hypothesis (Rosenberg, 1998).

Research has substantiated her claims. For instance, within Hazebroek et

al.'s (2001) study, 83 Australian undergraduates rated four videos on the appraisal

components postulated to generate anger – motivational relevance, motivational

congruence and blame (see Table 1.1). The first video depicted an antagonist

taking another person's car parking spot and the other showed money being taken

out of another person's bag. There were two versions of each video: one where

the actions of the antagonist were negative, such as stealing money, and another

where their intentions remained ambiguous. The researchers found that those with

high trait anger blamed the antagonist significantly more frequently (blame) and

significantly more readily identified the events as relevant to their own interests

(motivational relevance) than those with low trait anger (see Table 1.1). These

results were identical for both the ambiguous and unambiguous videos. The

researchers also showed that the appraisals explained significant amounts of

participants' reported feelings of anger in reaction to the videos. The study thus supported the trait-congruent hypothesis: high trait anger participants evaluated both ambiguous and non-ambiguous experiences in an anger-prone manner and intense levels of anger were elicited. Therefore, the findings imply that negative trait emotion may lead to trait-congruent biases in automatic cognitive appraisals and consequently generate trait-congruent negative emotions.

However, the researchers failed to find the anticipated relationship between trait anger and all three components of angry cognitive appraisals as described in Table 1.1. In particular, they did not find significant differences in how high and low trait anger participants evaluated motivational congruence (the extent to which the scenarios in the videos exerted a negative impact on their interests). However, this discrepant finding may be attributed to the methods used (Roseman, 2001; Roseman & Smith, 2001; Park, 2010). Within the study, participants described their appraisals by recalling these appraisals and noting them in a booklet rather than by giving automatic responses. Cognitive appraisal has been described as an instantaneous process based on implicit meanings of which persons are not overtly aware (Roseman, 2001; Roseman & Smith, 2001; Park, 2010); yet the investigators assessed participants' cognitive appraisals by asking them to state the content of their thoughts. This procedure not only involves effortful remembering of cognitions but also requires remembering information of which, as aforementioned, participants are not overtly aware. Therefore, this may have led to the contrary results for motivational congruence. Empirical work thus hints that a relationship exists between negative trait emotion and exaggerated negative cognitive appraisals that are trait-congruent in nature; however, this relationship needs to be clarified with further research.

Further research is also needed to understand how these exaggerated negative cognitive appraisals may influence the levels of resilience associated with high negative trait emotion. Studies have suggested that they may exert their impact by causing individuals high on negative trait emotion to become stuck in the intrusion phase. This has emerged in research into "spreading activation" (Bower, 1981; MacLeod & Rutherford, 1992). Spreading activation refers to uncontrollable biases in short-term memory that are triggered by intense negative emotions. These biases cause individuals to involuntarily attend to specific aspects of the experience (Wilkowski & Robinson, 2008) as well as to involuntarily recall specific memories (Bower, 1981). In cases of high negative trait emotion, it has been posited that the intense negative emotions trigger emotion-congruent biases in short-term memory which make emotion-congruent aspects of the experience and emotion-congruent memories particularly salient (Wilkowski & Robinson, 2008). This uncontrollable and automatic spreading activation is similar in nature to the prolonged intrusion phase described in Section 1.4.2.1:

> Slight elevations in state anxiety will automatically elicit a
> general pattern of selectivity which will further elevate state
> anxiety, increasing processing selectivity, and hence state anxiety,
> still more. (MacLeod & Rutherford, 1992, p. 489)

Therefore, spreading activation theory suggests that the relationship between exaggerated negative cognitive appraisals and the prolonged intrusion phase discussed in Section 1.4.2.3 may be applicable to cases of high negative trait emotion.

However, although these emotion-congruent attention and memory biases have been found in cases of high negative trait emotion (MacLeod & Rutherford, 1992), they have not been linked to resilience (Wilkowski & Robinson, 2008). For instance, Wilkowski and Robinson (2008) discussed the influence of angry cognitive appraisals (what they termed hostile interpretation biases) and the attention and memory biases (referred to as "ruminative attention") in cases of high trait anger. They claimed that the hostile interpretation biases (angry cognitive appraisals) triggered ruminative attention (uncontrollable attention to anger-triggering aspects of the experience) which then automatically generated anger and aggressive responses to the event. In support of their arguments, empirical work has linked trait anger to a range of aggressive behaviours (Cornell, Peterson & Richards, 1999; Deffenbacher, Huff, Lynch, Oetting & Natalie, 2000). However, such aggression is labelled as reactive aggression which has been described as unrelated to resilience (Hunter & Chandler, 1999; Rutter, 2007).These findings thus suggest that trait-congruent biases in negative cognitive appraisal may not be responsible for the difficulties in developing higher levels of resilience predicted among students high on negative trait emotion.

1.5.2. Negative trait emotion and negative thinking styles

Research suggests that negative trait emotion may also be linked to trait-congruent biases in negative thinking styles (Berry et al., 2005). For instance, findings imply that high trait anger may be associated with vengeful rumination (Berry et al., 2005). Berry et al. (2005) investigated the relationship between trait forgiveness, trait anger, vengeful rumination and responses to anger-provoking experiences among 62 United States undergraduates. Data were collected longitudinally over a two month period. As described in Section 1.4.2.4, vengeful

rumination fixates on anger-provoking features of an experience (Berry et al., 2005). Therefore, in line with the trait-congruent hypothesis, persons high on trait anger should be more prone to vengeful rumination. As anticipated, the findings revealed that higher scores on the vengeful rumination measure were negatively correlated with trait forgiveness, which in turn was significantly negatively related to trait anger. This suggested that trait anger may be related to higher levels of vengeful rumination, and provided support for the trait-congruent hypothesis. However, confidence in this relationship is limited because the researchers failed to directly assess the relationship between trait anger and vengeful rumination. They also did not include measures of trait anxiety and trait depression. Therefore, the relationship between negative trait emotion and trait-congruent thinking styles needs further investigation.

In addition, although researchers have associated negative trait emotion with thinking styles that are rigid in nature (Rosenberg, 1998), further investigation is also needed in this area. As discussed in Section 1.4.2.4, the rigidity of individuals' negative thinking styles is one of the main causes of its harmful impact on their levels of resilience. Rosenberg (1998) stated that without "the kind of personality change that may occur as a result of extensive psychotherapy, brain trauma, or long-term treatment with psychogenic drugs, affective traits remain fairly stable throughout the life span" (p. 251). She therefore implies that negative trait emotion may be associated with the rigid and unchanging negative thinking styles that exert a harmful influence on resilience.

However, existing findings provide little evidence to support her claims (Berry et al., 2005). For instance, in the Berry et al. study described above, the

45

researchers collected their data over a two-month period, therefore providing an

analysis of the impact of rigid, unchanging vengeful ruminations. The link

between trait anger and vengeful ruminations that was suggested in their findings

thus provides some support for the impact of rigid trait-congruent negative

thinking styles in cases of high negative trait emotion. However, as previously

detailed, confidence in their results is limited: the relationship between vengeful

ruminations and levels of resilience was not directly assessed. As such, further

research is needed in this area to determine whether negative trait emotion causes

individuals to become stuck in the working through phase as a result of rigid trait-

congruent negative thinking styles.

1.6.   Summary and conclusions

The tendency of life experiences to precipitate poor adjustment in some

cases but not others triggered the study of resilience. Generally, much empirical

work has since focused on identifying the personality traits or the delicate balance

of protective internal and external factors that are crucial to promoting resilience

(Kwok, Hughes & Luo, 2006; Rutter, 1987; Tiet & Huizinga, 2010). However,

examination of individuals classed as resilient within these paradigms has

revealed inconsistencies in how the concept has been defined (Flach, 1989;

Hunter & Chandler, 1999; Luthar et al., 1993; Palmer, 1997;). This evidence

suggested that in order to fully comprehend the intricacies of the complex

resilience concept, a shift in focus was necessary. This led to the surge in

empirical work focused on understanding the mechanisms underlying resilience

(Fine, 1991; Flach, 1990; Richardson, 2002). Such research has emphasized the

link between cognitive processes and resilient versus non-resilient outcomes.

Within the review, the pertinence of these arguments was supported by comparing the influence of cognitive processes, coping mechanisms and social support systems on individuals' resilience. The impact of social support systems and coping mechanisms has emerged mainly from developmental and biosocial theorists (referred to in the review as protective factors models). For instance, Campbell-Sills et al. (2006) emphasized the importance of more efficient task-oriented coping while social support has been highlighted by Hunter and Chandler (1999). The findings suggested that cognitive processes may exert a superior role on individuals' levels of resilience, further corroborating the proposed importance of understanding resilience as a process of 'disruption' and 'reintegration' as proposed by proponents within the former branch of enquiry.

Here, cognitive appraisal, thinking styles and meaning making have emerged as pertinent cognitive processes which may impact an individual's ability to successfully adapt or 'bounce back' from adversity (Brodsky, 1999; Fine, 1991; Richardson, 2002). This was shown in the review which introduced studies into these three main cognitive processes. However, as the review emphasized, while research on cognitive appraisal, negative and positive thinking, and meaning making exists, investigations aimed at comparing how these two processes may influence individuals' levels of resilience is limited. This is the main aim of the thesis: it seeks to evaluate how these cognitive processes influence student adaptation to university life.

Another main aspect of the proposed analysis is the exploration of the impact of these cognitive processes on the relationship between negative trait emotion and resilience. This incorporation of a personality trait – negative trait emotion – was an attempt to bridge the gap between the various branches of

resilience research. Such work was suggested by Cantor (1990) however limited

research has emerged. Contrarily, researchers still emphasize a range of

personality traits. For instance, Fine's (1991) review of the literature highlighted

the impact of the will to overcome and the skill of "turning dross into gold"

characterized by hope, self-esteem and having a purpose in life (p. 464). In

addition, hardiness has received a great deal of attention (Almedom, 2005;

Bartone, 2006; Connor & Davidson, 2003; Fine, 1991). Therefore, as a first step

in emphasizing the importance of focusing on resilience as a process, the

cognitive processes mediating the relationship between a personality trait

(negative trait emotion) and resilience will be evaluated.

Although the studies presented here have not exclusively utilised

undergraduate populations, researchers argue that regardless of the experience

being faced, the same cognitive processes are required for adaptation to take place

(Flach, 1990; Fine, 1991). Therefore, the findings presented here are relevant to

the intended research: the cognitive processes discussed in the review may be

responsible for the difficulties students high on negative trait emotion may have

in adjusting to university life. This is explored in the next Chapter which presents

a review of the student adjustment literature. The review will focus specifically on

studies which have explored the proposed relationships between negative trait

emotion, cognitive processes and resilience among first-year undergraduate

students and the impact of these relationships on how these students adapt to

university life.

Chapter 2 Literature review (student population)

The thesis performs its analysis by applying the framework described in the previous Chapter to understanding student adjustment to university life. This Chapter provides a brief review of studies which have explored the factors of interest – negative trait emotion, cognitive processes and resilience – among students adapting to the first year of entering university. The review will begin by highlighting the significance of resilience, negative trait emotion and cognition to understanding how students adapt to university. This will be followed by an evaluation of research into the relationships between negative trait emotion and the cognitive processes of interest (cognitive appraisal, thinking styles and meaning making) and how these relationships impact student adjustment to university life. It will conclude by introducing the main research questions being evaluated in the thesis and detailing how these will be assessed in the subsequent chapters.

2.1 Resilience and adjusting to university life

Researchers suggest that entering university triggers the resilience process described in Chapter 1 (Jackson et al., 2000). Evidence in support of this has emerged from explorations of undergraduate student populations in America (Dyson & Renk, 2006; Pittman & Richmond, 2008; Rayle & Chung, 2007), Canada (Jackson et al., 2000; Struthers, Perry & Menec, 2000), China (Tao, Dong, Pratt, Hunsberger & Pancer, 2000), Australia (Stallman, 2010), Britain (Wilcox, Winn & Fyvie-Gauld, 2005) and Europe (Schaufeli, Martínez, Pinto, Salanova & Bakker, 2002). These studies highlight the negative impact that the numerous demands and challenges of university – such as taking and studying for

exams, identity formation and independence from parents – can have on students'

social, emotional, physical and academic functioning. Their findings suggest the

presence of the cycle of "disruption" and "reintegration", which was described in

Chapter 1 as integral to the resilience process.

Results have specifically shown that upon entering university, students may

initially experience the intense emotional chaos of the "disruption" phase

(Jackson et al., 2000; Pritchard, Wilson & Yamnitz, 2007; Wintre & Yaffe, 2000).

For instance, Pritchard et al. (2007) explored how first-year American

undergraduate students' responded to beginning university life. Data were

collected in two waves: primarily at the start of the first semester and secondly

one month before the end of the second semester. Among their sample of 525

students, the researchers found significant increases in health problems, alcohol

consumption and intoxication and negative moods (such as anxiety, depression

and anger). Similarly, Wintre and Yaffe (2000) found that by the end of their first

academic year, their sample of 408 first-year Canadian students reported

significant increases in levels of depression. These findings suggest that a

relationship exists between entering university and experiencing the "disruption"

phase of the resilience process.

However, similar to the studies cited in Chapter 1, research hints that some

students are able to enter "reintegration" following this disruption phase (Jackson

et al., 2000). Jackson et al. (2000; p. 2100) claim that these are the students who

eventually adjust to university and "blossom" throughout the remainder of their

university lives. These students fall into the first group of individuals discussed in

Chapter 1 who reintegrate with little difficulty.

Research has also highlighted the presence of students who become "stuck" in the stage of disruption. These students fall into the second group discussed in Chapter 1: they exhibit increasingly severe social and emotional problems as university continues and fail to adjust to university life (Dyson & Renk, 2006). Evidence of their existence emerges from longitudinal studies which show that some students' levels of depression and anxiety can significantly increase throughout the subsequent years of their degrees (Dyson & Renk, 2006; Stewart, Betson, Lam, Marshall, Lee & Wong, 1997; Tao, Dong, Pratt, Hunsberger & Pancer, 2000). For instance, Stallman (2010) found that 19.2% of 6,749 Australian university students had mental health problems and 67.4% had subsyndromal symptoms. These rates were significantly higher than age-matched members within the general population where only 3% reported mental health problems. Data were collected at the beginning of the second week of semester 2 from a sample in which 27.25% were first-year students; 49.65% were second- and third-year students and 23.1% were postgraduate students. The study thus enabled some understanding of student adjustment across the university life span. Its findings suggest that the problems students may have in adjusting to university could be linked to being stuck in disruption and subsequently not being able to develop higher levels of resilience. This hints that evaluating students' levels of resilience can give an insight into how they adapt to their university experiences.

2.2   Negative trait emotion, resilience and adjusting to university life

Research has also shown that students high on negative trait emotion may be more likely to get stuck in disruption (Gick & Thompson, 1997; Stewart et al., 1997; Tao et al., 2000). For instance, in their exploration of 197 British

undergraduates, Allan and Gilbert (2002) showed that higher levels of trait anger were significantly positively correlated with students' levels of depression. Within their study, depression was evaluated using the Centre for Epidemiological Studies Depression Scale (CES-D; Radloff, 1977), a widely validated measure for depression frequently used within the general population (Segerstrom et al., 2003; Tao et al., 2000). These findings suggest that the relationship between negative trait emotion and resilience discussed in Chapter 1 may also exist within the university student population. As such, confidence can be placed in the proposed harmful influence of negative trait emotion on how undergraduate students adjust to life at the University of York.

2.3   Coping strategies, social support, cognition and student adjustment

Similar to the arguments put forth in Chapter 1, coping strategies, social support and cognition have also been highlighted among the main factors that may influence student adjustment to university life (Dyson & Renk, 2006; Pittman & Richmond, 2008; Struthers et al., 2005; Wilcox, Winn & Fyvie-Gauld, 2005). The following section will explore the relationship between each of these factors and student adjustment. It will specifically examine the extent to which cognition influences the relationship between coping strategies and student adjustment as well as between social support and student adjustment.

2.3.1.   Coping strategies, cognition and student adjustment

There is a body of evidence showing that students' cognitive processes may explain the role coping strategies play in student adjustment to university life (Dyson & Renk, 2006; Struthers, Perry & Menec, 2005). For instance, Dyson and Renk (2006) explored the influence of "efficient" coping (task-oriented coping)

and "less efficient" coping (emotion-focused coping and avoidant coping) on levels of depressive symptomatology among 74 American first-year undergraduates. They found that although avoidant coping significantly predicted higher depression scores, the other two forms of coping were not related to students' depression levels. The researchers therefore hypothesised that the inconsistent influence of coping on depressive symptoms may be explained by a "third variable".

Dyson and Renk proposed that this "third variable" may be students' perceptions of the number of changes to their lives that university had generated. Such perceptions involve the cognitive processes described in Chapter 1. This suggests that the impact of coping on students' resilience may rely on cognition. It can be argued that the researchers did not directly assess whether cognition did in fact exert the proposed impact. However, their postulations align with those of other researchers (Struthers et al., 2005) as well as the arguments put forth in Chapter 1. This hints that students' capacity to adjust to university life may rely more heavily on their cognitions than on the coping strategies they use.

2.3.2.   Social support, cognition and student adjustment

Studies also suggest that the impact of social support on student adjustment to university life may be influenced by cognition (Pittman & Richmond, 2008; Terenzini, Rendon, Upcraft et al., 1994; Wilcox, Winn & Fyvie-Gauld, 2005). Specifically, these researchers argue that how students perceive the new social support systems that they develop upon entering university influences how they adjust to university life. Wilcox, Winn and Fyvie-Gauld (2005) performed an in-depth qualitative analysis of 34 first-year students at the University of Brighton in

the United Kingdom. They found that the majority of students who struggled with adjustment were those who recognised that social support was available but focused on the absence of "compatible" support systems. This is epitomised in the quote presented below where Beth describes difficulties she experienced in finding her "place" at university. She specifically contrasts having "loads of friends" to having "good friends", the latter of which was more crucial:

> '…But yes I guess making good friends is really important, rather than making like loads and loads of friends it's making ones that you really care about is really important here…' – Beth, 20 (Wilcox, Winn & Fyvie-Gauld, 2005, p. 713).

This assessment of "compatibility" highlights the underlying influence of cognition on the role played by social support in student adjustment to university: it hints at the superior impact of how students regard the type of support available to them compared to the mere presence of said support. Furthermore, although this study can be criticised for its small sample size, it aligns with other findings which also highlight this impact of cognition (Pittman & Richmond, 2008; Terenzini, Rendon, Upcraft et al., 1994). Therefore, empirical work supports the role of cognition in determining the influence of social support on how students adjust to university life. The review will now present research which has explored the impact of cognition on student adaptation to university.

2.4   Types of cognition and student adjustment

The previous Chapter highlighted three cognitive processes which, according to researchers, interact to determine individuals' levels of resilience – automatic cognitive appraisal, thinking styles and meaning making. Research to

date has not explored the influence of finding meaning in the university experience on student adjustment. Therefore, studies which have evaluated the impact of automatic cognitive appraisal and thinking styles on student adjustment will now be considered. Each section will also include a brief review of research into the relationship between the particular cognitive process and negative trait emotion.

2.4.1. Negative trait emotion, cognitive appraisal and student adjustment

Within Chapter 1, it was argued that negative cognitive appraisals exert their influence on resilience by generating negative emotions which subsequently trigger the meaning making process (Flach, 1990; Richardson, 2002; Tedeschi & Calhoun, 2004). It was further asserted that in some cases (such as among individuals high on negative trait emotion), exaggerated cognitive appraisals occur based on biased evaluations on four main components – motivational relevance, motivational congruence, blame and coping potential (see Table 1.1) – and these exaggerated appraisals lead to intense negative emotions which prevent such individuals from completing the meaning making process (Smith & Lazarus, 1993).

A relationship between exaggerated cognitive appraisals and negative trait emotion has also emerged in studies within the university student population (Aktekin, Karaman, Senol et al., 2001). Atekin et al. (2001) found that students high on trait anxiety reported significantly more intense negative cognitive appraisals. Confidence in the findings is increased based on aspects of the study. For example, the researchers collected data from their participants (219 Turkish

students) on two occasions over the period of a year. Therefore, due to the longitudinal nature of their study, their findings provide some support for the proposed relationship between negative trait emotion and cognitive appraisals within the student population. However, the study can be criticised since the researchers failed to directly evaluate anxious cognitive appraisals. It is argued that trait anxiety should be specifically related to anxious cognitive appraisals (Rosenberg, 1998), but these were not assessed by Atekin et al. Instead, cognitive appraisals were measured using participants' ratings of a list of university experiences, such as "financial problems" and "dissatisfaction with social activities", on a scale of 0 to 10 in terms of the level of negative emotion triggered. This method prevented a full evaluation of the relationship between trait anxiety and anxious cognitive appraisals. Furthermore, the reliability and validity of the measure used to assess cognitive appraisals was not reported. Therefore, the relationship between negative trait emotion and cognitive appraisal within the student population warrants further examination.

However, such biases have been found to negatively impact student adjustment to university life (Prancer, Pratt & Alisat, 2000; Stewart et al., 1997). These researchers have specifically linked negative evaluations of coping potential to poor adjustment among Chinese and Canadian university students. Within their studies, students' appraisals of coping potential were evaluated by assessing the frequency with which they felt "overloaded" by their university experiences using the Perceived Stress Scale (PSS; Cohen, 1986). PSS scores were correlated against scores on the Student Adaptation to College Questionnaire (SACQ; Baker & Siryk, 1986). The SACQ assesses students' levels of adaptation to university in four areas: academic, social, personal-

emotional and attachment. Both studies used large samples ranging from 303 to 356 undergraduates. In addition, the measures used have produced high indices of reliability in previous empirical work (the lowest alpha was 0.77). The two analyses produced comparable results: higher scores on the PSS were significantly negatively correlated with SACQ scores. This suggests that a relationship exists between biases in negative cognitive appraisals and student adjustment to university life. However, these results are based on correlations which do not enable any conclusions to be drawn concerning causality. Furthermore, similar to the evidence presented in Chapter 1, research findings suggest that a stronger association exists between longer term cognitive processes (thinking styles) and student adjustment.

2.4.2. Negative trait emotion, thinking styles and student adjustment

The previous chapter described two ways in which thinking styles influenced resilience. On the one hand, it emphasised the benefits of positive thinking styles on individuals' capacity to complete the meaning making process. On the other hand, it discussed the harmful impact of negative thinking styles on their ability to complete this process. In Chapter 1, it was also argued that among individuals high on negative trait emotion, increased negative thinking styles may exert an influence on their levels of resilience.

Studies exploring the relationship between negative trait emotion and negative thinking styles have substantiated the associations proposed in Chapter 1 (Reidy, 2004). Reidy assessed 30 British undergraduates on their levels of trait anxiety and the extent to which they generally thought about 20 worry items ("That my life has no purpose") and 20 non-worry items ("That I will read a

good book"). Therefore, it can be argued that the measure evaluated both negative thinking styles (worry items) and positive thinking styles (non-worry items). Confidence in the findings is increased based on a separate group of 26 students having rated the items in terms of valence before the main experiment and classifying the worry items as more negative than the non-worry items. Therefore the validity of the items as an assessment of negative and positive thinking styles is supported.

The results showed that high trait anxious students thought significantly more about worry items and thought significantly less about the non-worry items. These findings support the proposed relationship between negative trait emotion and negative thinking styles: students high on trait anxiety thought in a negative manner (thought more frequently about non-worry items). This suggests that negative trait emotion influences students' thinking styles in a similar manner as was put forth in Chapter 1. Even further, the results hint that a relationship may exist between negative trait emotion and reduced positive thinking styles: students high on trait anxiety thought in a less positive manner (thought more frequently about worry items). Evidence to support the impact of positive and negative thinking styles on student adjustment follows.

2.4.2.1.   *Positive thinking styles and student adjustment*

Within the student literature, optimistic thinking is defined as a "chronic adaptive...thinking style" (Jackson et al., 2000, p. 2113) in which students hold positive academic expectancies even "… when they confront adversity or difficulty in their [university] lives" (Scheier et al., 2000, p. 3). It is characterised by a "naïve, enthusiastic and boundless idealism" about university life such as the

belief that university would offer more opportunities for intellectual, social and personal growth than is typically provided. (Stern, 1966, p. 411). For instance, Chemers, Hu and Garcia (2001) showed that among 256 American students, positive academic expectations included the certainty that they would get good evaluations and grades throughout university.

Studies exploring the influence of optimistic thinking on student adjustment contradict the positive impact of optimistic thinking discussed in Chapter 1 (Smith & Wertlieb, 2005; Weissberg, Owen, Jenkins & Harburg, 2003). These researchers found that after their first year at university students with higher levels of optimistic thinking (higher positive academic expectations) reported poorer adjustment than those without such thinking patterns.

Jackson et al., (2000) suggested that such discrepant outcomes may be attributed to the two forms of optimistic thinking that are present within the university student population – 'unrealistic' optimistic thinking and 'prepared' optimistic thinking (Jackson et al., 2000, p. 2111). According to the researchers, these two forms of optimistic thinking differ on an additional dimension – the levels of complexity of students' thinking styles – and it is this difference which influences their impact on student adjustment to university (Jackson et al., 2000; Pancer et al., 2000). For them, students with thinking styles which are positive and complex had prepared optimistic thinking styles while those with unrealistic optimistic thinking styles engaged in positive thinking that was not complex in nature (Jackson et al., 2000; Pancer et al., 2000).

This meant that students with prepared optimistic thinking styles were optimistic but they also considered the complicated nature of being at university,

that is, they possessed an understanding of "how they would play an active role in the transition into university by coping with challenges, adapting, and growing personally" (Jackson et al., 2000, p. 2112 - 2113). For example, in response to these questions – (1) In general, what do you expect university life to be like? (2) What do you expect classes and school work to be like at university? (3) What do you think university social life will be like? – a student was classified as having a complex positive thinking style if his or her responses were similar to the following: "I look forward to attending classes and learning more in depth things we've only begun in high school" and "I think that as long as I keep on top of things and don't let them slide I'll be able to get everything done". According to these researchers, complex positive thinking was evidenced in the students' "looking forward" to university and their awareness of the need to "keep on top of things". This showed that they had positive academic expectations but these were based on a consideration of the various demands and pressures of university life.

Their arguments are supported by Pancer et al. (2000). In similar trend, these researchers argued that students with positive and complex thinking styles not only think about their university lives in a positive manner but also in a multidimensional fashion (as opposed to a simple or one-dimensional manner). For Pancer et al., these students had considered that their university lives would have many different dimensions and had integrated these various dimensions with one another.

Both Jackson et al. (2000) and Pancer et al. (2000) claim that the complexity of students' positive thinking styles (not just the presence or absence of positive thinking styles) may be the longer-term cognitive process that influences how they adjust to university life. According to these researchers,

"unrealistic" optimists would have more difficulty adjusting to university compared to "prepared" optimists. Their findings supported these claims (Jackson et al., 2000; Pancer et al., 2000). For instance, in an assessment of 107 Canadian students over a 4 year period, Jackson et al. (2000) found that students with "prepared" optimistic thinking styles adjusted better to university life than students with "unrealistic" optimistic thinking styles: the former reported significantly higher scores on the Student Adaptation to College Questionnaire (SACQ; Baker & Siryk, 1986) as well as significantly lower levels of depression – assessed using the Centre for Epidemiologic Studies Depression scale (CES-D; Radloff, 1977). Therefore, studies suggest the need to consider the level of complexity of students' positive thinking styles in the intended analysis into student adjustment.

2.4.2.2.   *Negative thinking styles and student adjustment*

Research also suggests that the complexity of students' negative thinking styles may determine the influence of these thinking styles on how they adjust to university life (Stewart et al., 1997). Stewart et al. (1997) explored the influence of worry on student adjustment among 121 Chinese undergraduates and found that worry did not exert a harmful influence on student adjustment, contradicting the role of negative thinking styles that was proposed in Chapter 1. Specifically, no relationship emerged between participants' levels of worry and their levels of depression and anxiety over an eight month period. Their study can be criticised for the measure used to assess worry: students did not fill in a validated worry questionnaire; instead they were asked about the extent to which they thought "about the future" on the scale on a 5-point Likhert scale. However, other

researchers highlight the impact of the complexity of students' negative thinking styles (Jackson et al., 2000; Pancer et al., 2000).

According to these researchers, students with negative thinking styles that were complex in nature (showed evidence of having considered and integrated the multiple dimensions of university life) adjusted better to university than those with negative thinking styles that were simple or one-dimensional in nature. However, this was not directly assessed. Jackson et al. (2000) showed that students with negative thinking styles (negative academic expectations) that were not complex reported significantly lower scores on the Student Adaptation to College Questionnaire (SACQ; Baker & Siryk, 1986) over the four year degree period compared to those with: (1) complex positive thinking styles and (2) positive thinking styles that were not complex. However, no comparison was made between students with complex negative thinking styles and negative thinking styles that were not complex. Therefore, the need remains to evaluate the impact of the complexity of students' negative thinking styles on how they adjust to university.

2.5   Summary and conclusions

The review highlighted the presence of a similar impact of negative trait emotion, automatic cognitive appraisal, thinking styles and resilience on student adjustment to university as was described in Chapter 1. However, it also revealed four main avenues in need of further research:

(1) clarifying the impact of negative trait emotion on negative cognitive appraisals and negative thinking styles;

(2) exploring the impact of the complexity of students' negative and
positive thinking styles on student adjustment;

(3) identifying whether cognitive appraisals or thinking styles exerts a
greater influence on how students with high negative trait emotion
adjust to university life; and

(4) understanding the role played by finding meaning on student
adjustment.

2.6   Overview of chapters

This thesis consists of six empirical chapters: the first five primarily aimed
to adjust the framework put forth in this review to make it more applicable to
exploring student adjustment within the University of York. This was necessary
because Chapter 1 presented studies which explored the relationship between the
factors of interest – negative trait emotion, cognition and resilience – among
populations adjusting to other experiences and although Chapter 2 applied the
framework to student adjustment, several gaps remained. The remaining chapter
then applies the adjusted framework to examining student adjustment to the
University of York.

Chapter 3 compares the influence of negative cognitive appraisals and
negative thinking styles on the relationship between negative trait emotion and
resilience using students at the University of York. It assesses which of these two
cognitive processes exerts the more robust influence on these students' levels of
resilience. In addition, it explores the relationship between negative cognitive
appraisals and negative thinking styles and whether this interaction influences the
relationship between trait anger and resilience, trait anxiety and resilience as well

as trait depression and resilience. This Chapter also provides a preliminary evaluation of the trait congruent hypothesis in two ways. Primarily, it explores the relationship between trait anger and angry cognitive appraisals, trait anxiety and anxious cognitive appraisals as well as trait depression and sad cognitive appraisals. Secondly, it evaluates the relationship between trait anxiety and future- versus past-oriented negative thinking, trait anger and future- versus past-oriented negative thinking as well as trait depression and future- versus past-oriented negative thinking.

Chapter 4 compares the influence of positive cognitive appraisals and positive thinking styles on the relationship between negative trait emotion and resilience using students at the University of York. Its main aim is to assess which of these two cognitive processes exerts the more robust influence on these students' levels of resilience. In addition, it explores the relationship between positive cognitive appraisals and positive thinking styles and whether this interaction influences the relationship between trait anger and resilience, trait anxiety and resilience as well as trait depression and resilience. It also evaluates the trait congruent hypothesis by exploring the relationship between trait anger and future- versus past-oriented positive thinking, trait anxiety and future- versus past-oriented positive thinking as well as trait depression and future- versus past-oriented positive thinking.

Chapter 5 performs a factor analysis of the three negative trait emotion measures. This was done mainly because the findings of Chapters 3 and 4 provided evidence of similarities in the cognitive processes associated with trait anxiety and trait depression. Therefore, it became necessary to evaluate whether

the three negative trait emotions represented the three independent constructs as postulated by Rosenberg (1998).

Chapter 6 explores the impact of the complexity of students' negative and positive thinking styles on their levels of resilience. It specifically compares the impact of complex positive thinking and complex negative thinking on the levels of resilience of students high on negative trait emotion within the University of York. The meaning making process described in Chapter 1 was not derived from studies into student adjustment. Therefore, Chapter 7 assesses whether the proposed two-stage meaning making process (that students search for and discover meaning as comprehensibility and meaning as significance) is applicable to the University of York student population.

Chapter 8 then evaluates the main research question of the thesis – how does cognition influence adjustment to university life among undergraduate students high on negative trait emotion? – incorporating the adjustments derived from the findings of the previous studies. As discussed in Chapter 1, this thesis proposed that negative trait emotion impacts students' resilience through a three-path mediation: negative trait emotion generates negative (maladaptive) thinking styles which subsequently prevent individuals from completing the meaning making process and developing higher levels of resilience. Chapter 8 thus examines how the relationship between thinking styles and meaning making is related to the levels of resilience of students high on negative trait emotion. Chapter 10 then presents a broad discussion of the thesis' main findings, ending with a general conclusion.

Chapter 3 An examination of the influence of negative cognitive appraisals and negative thinking styles

This chapter applies aspects of the framework previously discussed. Specifically, it evaluates the influence of automatic negative cognitive appraisals and negative thinking styles on the levels of resilience of students high on negative trait emotion. Its findings will be used to adjust the model so that it is better suited to the intended evaluation of student adaptation to university life. The cognitive process – either automatic negative cognitive appraisals or negative thinking styles – that emerges as more influential will subsequently be one of the main focuses within the remaining analyses.

This evaluation is presented in a series of three studies. Study 1 compares the impact of negative cognitive appraisals and negative thinking styles on the relationship between negative trait emotion and resilience. Study 2 analyses the relationship between negative cognitive appraisals and negative thinking styles and whether this interaction influences students' levels of resilience. Study 3 performs a deeper exploration of the impact of negative thinking styles on the relationship between negative trait emotion and resilience by evaluating the influence of future- versus past-oriented negative thinking styles.

3.1 Study 1 Negative trait emotion, negative cognitive appraisals, negative thinking styles and resilience

This study compares the impact of negative cognitive appraisals and negative thinking styles on the relationship between negative trait emotion and resilience. As discussed in Chapter 1, evidence suggests that negative thinking styles may exert a stronger influence than biases in negative cognitive appraisal

(Hunter & Chandler, 1999; Rutter, 2007; Wilkowski & Robinson, 2008).

However, these existing findings may be due to flaws inherent in the methods

typically used (Park, 2010).

For instance, on the one hand, cognitive appraisals tend to be evaluated

either using implicit experimental procedures such as words (e.g. Mogg, Bradley

& Hallowell, 1994; Parrot, Zeichner & Evces, 2005) or retrospective reports (e.g.

Hazebroek et al., 2001; Tarfrate et al., 2002). These suffer from limited external

validity as words do not adequately reflect the stimuli that individuals encounter

in their daily lives while retrospective reports do not accurately assess the

automatic processes underlying cognitive appraisals. Furthermore, to date, no

study evaluating the cognitive appraisal biases associated with trait anger, trait

anxiety or trait depression has incorporated all three negative trait emotions

within their analyses (Mogg et al., 1994; Parrot et al., 2005; Rusting, 1998). As

such, existing findings only provide limited support for the trait-congruent

hypothesis: they fail to show that the negative trait emotion under investigation is

uniquely associated with trait-congruent cognitive biases as they do not control

for the impact of the other two negative emotion traits that may be exerting an

influence.

On the other hand, negative thinking styles have been frequently assessed

using a measure of depressive rumination, typically the Ruminative Responses

Scale of the Response Styles Questionnaire (RRS; Nolen-Hoeksema & Morrow,

1991). These studies therefore ignore the other dimensions of negative thinking

styles that may exist and thus may not represent valid assessments of the

influence of negative thinking styles. Therefore, more refined methods will be

used in order to provide a better assessment of negative cognitive appraisals and

negative thinking styles.

It was anticipated that trait anger, trait anxiety and trait depression would all

be negatively correlated with resilience but positively correlated with the scores

on the negative thinking styles measure and trait-congruent biases in negative

cognitive appraisals. Negative correlations were also predicted between the

negative thinking styles measure and resilience as well as between negative

cognitive appraisals and resilience. Significant partial mediating relationships

were anticipated in accordance with the mediation models presented in Figure 3.1.

A preliminary study, used to standardise the stimuli to be used in assessing

negative cognitive appraisals is reported before the main analysis.
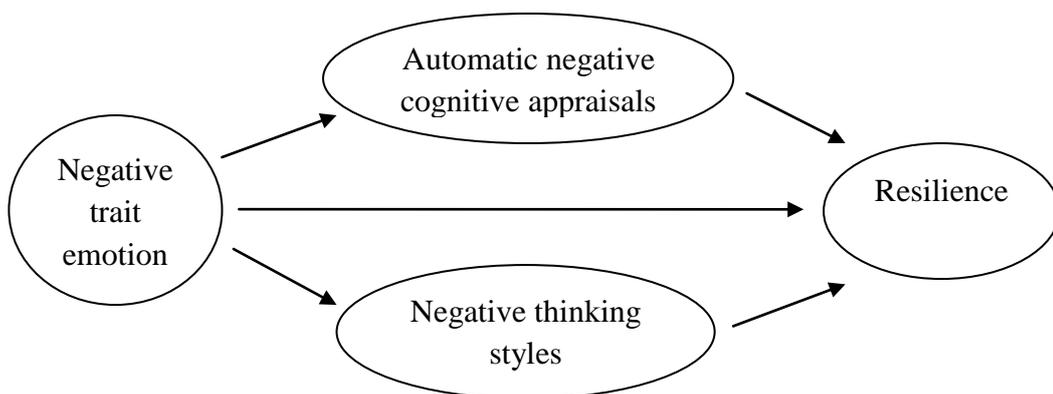
Figure 3.1. Graphic representation of the partial mediation model being evaluated

in Study 1.

3.1.1   Preliminary validation study: Standardization of video material.

Videos were used to assess negative cognitive appraisals (Hazebroek et al., 2001). These were chosen for three main reasons: (1) they enable participants to get involved in the stimuli and thus increase the likelihood of obtaining accurate results (Rusting, 1998); (2) they facilitate an evaluation of automatic cognitive processes (Prinzmetal, McCool & Park, 2005) and (3) they allow cognitive appraisals to be assessed using a variety of scenarios, enabling an evaluation of the trait-congruent hypothesis (Mogg et al., 1994; Parrot et al., 2005; Rusting, 1998).

3.1.1.1.   Method

3.1.1.1.1   Participants

Participants were recruited using the online research participant pool within the Psychology Department of the University of York. Ten students (8 White British, 2 Chinese) took part in the experiment in return for financial reward or course credit. The mean age of the sample was 19.0 years (Range = 18 − 26). The sample also comprised 7 females and 3 males.

3.1.1.1.2   Materials and apparatus

Thirty-seven silent video clips depicting a variety of scenes, such as a waitress spilling a customer's coffee, were used.

3.1.1.1.3   Procedure

Ethical approval for all studies within the thesis was obtained from the Psychology Department of the University of York. Videos were presented

electronically and in a random order using the E-prime 2.0 software (Schneider,

Eschmann & Zuccolotto, 2002). Participants rated the videos based on statements

asking them to imagine experiencing the event from different perspectives. For

instance, before viewing a video depicting a waitress spilling a customer's coffee,

participants were told to take on the role of the customer. Ratings were made on

three scales asking "How anxious would you feel?", "How sad would you feel?"

and "How angry would you feel?". Each of these scales ranged from 1 (*not at all*)

to 6 (*extremely*).

After giving their informed consent, participants viewed the first statement

telling them which role they were going to play in the imminent video. The

statement was replaced by the video after 500 milliseconds. Each video lasted for

10 seconds. Scales immediately followed the video on screen. Ratings were made

by pressing the corresponding button (1-6) on the keyboard. Answering one scale

caused the next scale to be displayed automatically. The three scales were

presented randomly.

3.1.1.1.4   *Data analysis*

The average anxious, sad and angry ratings across all participants were

computed for each video. Based on these averages, videos were labelled as *high*,

medium or *low* for each negative emotion. The *high* category comprised videos

whose ratings were one standard deviation above the average rating whereas the

low category incorporated videos whose ratings were one standard deviation

below the average rating. The *medium* group consisted of videos whose ratings

lay between these two boundaries. In this way, it was possible for one video to be

high on anxiety, *medium* on anger and *low* on sadness.

3.1.1.2.   Results

The number of videos within the angry, sad and anxious emotion categories

is given in Table 3.1. Based on the distribution shown in Table 3.1, twenty-four

clips were chosen for the main analysis. The videos were selected so as to include

stimuli which were rated high on all emotions (n=5); medium on all emotions

(n=5); low on all emotions (n=5); or received a mixture of high, low and medium

scores on all emotions (n=9). This was done to incorporate the range of

emotionally-provoking stimuli that is recommended in the literature (Rusting,

1998) and that would enable an assessment of the trait-congruent hypothesis

(Rosenberg, 1998).

An additional three clips were assigned as practice videos to familiarise

participants with the task. Videos designated to the practice section were chosen

so as to introduce participants to the range of emotionally intense videos (high,

low and medium) to which they would be exposed in the remainder of the study.

Table 3.1.

*Number of videos generating high, medium and low ratings of anger, sadness and
anxiety*

		Emotion	
Category	Anger	Sadness	Anxiety
High	9	6	8
Medium	18	21	21
Low	10	10	8

3.1.2   The main analysis

3.1.2.1.   Method

3.1.2.1.1   Participants

Data were obtained from 106 students of the University of York (53 males and 53 females). The sample was collected using online and poster advertising around the University of York campus. Participants received a small financial reward or course credit in return for participation. The mean age of the sample was 22.63 years (Range= 18 - 41). The sample included White British (45.3%), non-UK European (17%), Asian British (12.3%), Chinese (19.8%), American (0.9%), African/Caribbean (2.8%), Brazilian (0.9%) and Hispanic (0.9%) students.

3.1.2.1.2   Materials and apparatus

(1) Trait anger was measured using the trait subscale of the State-Trait Anger Expression Inventory-2 (STAXI-II; Spielberger, 1999; see Appendix A1). It consisted of 10 items such as "I am generally quick-tempered". Participants rated these questions on a scale of 1 (*almost never*) to 4 (*almost always*). After recoding the four reverse-scored items, a total trait anger score was derived by summing eight of the ten questions. The STAXI-II has demonstrated good internal consistency in non-clinical adult samples (alphas = 0.84 – 0.86) (Spielberger, 1999).

(2) Trait anxiety was assessed using the trait anxiety subscale of the State-Trait Anxiety Inventory (STAI ; Spielberger, Gorsuch, Lushene, Vagg & Jacobs, 1983; see Appendix A2). The STAI comprised 20 items evaluated on a scale of 1 (*almost never*) to 4 (*almost always*). It included items such as "I feel nervous and

restless" which were rated based on how participants generally felt. Levels of trait

anxiety were calculated by recoding ten reverse-scored items and then adding all

scores. Spielberger et al. (1983) reported a median alpha coefficient of 0.90 for

the STAI using large independent samples of college undergraduates, military

recruits, and working adults.

(3) Trait depression was indexed by the trait depression subscale of the

State-Trait Personality Inventory (STPI-TD; Spielberger, Reheiser, & Sydeman,

1995; see Appendix A3). It included 10 questions measuring individuals'

dispositional tendency to experience intense feelings of depression or sadness.

Items such as "I feel hopeless" were rated on a scale of 1 (*almost never*) to 4

(*almost always*) based on how individuals felt on a general basis. Five reverse-

scored items were included. Trait-depression scores were attained by totalling all

items following reverse-scoring. The scale has strong internal consistency,

producing alpha coefficients above 0.80 for both genders (Spielberger et al.,

1995).

(4) Negative cognitive appraisals were assessed by asking participants to

rate 10-second clips as fast as possible (see Section 3.1.1). There were 24 clips in

addition to 3 practice videos depicting such events as cats fighting, a woman

having difficulty standing after slipping on ice and children eating. Videos were

presented electronically in a random order using E-prime 2.0 software (Schneider

et al., 2002). Participants rated the videos based on how angry, anxious and sad

they would feel within the roles they had been asked to adopt from 1 (*not at all*)

to 6 (*extremely*).

Videos were assessed on two scales: intensity of ratings and speed at which

ratings were given (in milliseconds). Higher and faster ratings signified more

intense and automatic negative emotional reactions, and thus indicated the
presence of the biased/exaggerated negative cognitive appraisals discussed in
Chapter 1. Within this analysis, the intensity of ratings and the speed of the
ratings were combined to form a composite measure of negative cognitive
appraisals (Salthouse & Hedden, 2002). This was performed by calculating the
ratio – intensity: time (Salthouse & Hedden, 2002). This method was chosen
because it yields a single variable that may best reflect the interaction between
speed and intensity of ratings. However, it needed to be adapted to make it
applicable for the current analysis (Salthouse & Hedden, 2002). Therefore, the
ratio was calculated by initially differentially weighting the intensity of the ratings
and then performing the following calculation (speed of ratings ÷ weighted
intensity of ratings).

(6) Negative thinking styles were evaluated using a measure of rumination.
As discussed in Chapter 1, rumination represents one of the dimensions of
negative thinking styles. Rumination scores were obtained with the Rehearsal
subscale of the Emotion Control Questionnaire-Revised (ECQ2; Roger &
Najarian, 1989; see Appendix A4). The ECQ2 was found to be significantly
related to vengeful rumination (Emmons, 1992), trait anxiety (Roger & Najarian,
1989) and depressive rumination (Siegle et al., 2004). These findings suggested
that the ECQ2 is a broad measure of rumination which may assess the three
emotion-congruent dimensions of negative thinking styles pertinent to this study.
Thus the measure was considered ideal for the intended analysis. The ECQ2 used
14 dichotomous (*true/false*) items (e.g. "I remember things that upset me or make
me angry for a long time afterwards"), two of which were reverse-scored, to
assess individuals' tendency to ruminate over emotionally upsetting events.

Higher scores reflected a greater tendency to engage in rumination with a total possible score of 14. Therefore, for this study, higher scores signalled the presence of negative thinking styles. Research within a similar undergraduate population (students at the University of York) documented a large alpha coefficient of 0.86 for the scale (Roger & Najarian, 1989).

(7) Resilience was evaluated with the Connor-Davidson resilience scale (CD-RISC; Connor & Davidson, 2003; see Appendix A5), which is a 25-item questionnaire assessing individuals' capacity to adapt to their experiences by evaluating the degree to which they possess factors that have been highlighted by research as important to adjustment (Farber, Schwartz, Schaper, Moonen & McDaniel, 2000) such as whether individuals had a sense of direction in life (e.g. "I have a strong sense of purpose in life") and accepted change as a natural part of life (e.g. "Good or bad, I believe that most things happen for a reason"). The items were rated on a 5-point scale ranging from 1(*not at all typical of me*) to 5 (*true nearly all the time*). Higher CD-RISC scores have been associated with lower psychiatric symptoms in adulthood following exposure to childhood abuse and neglect (Campbell-Sills et al., 2006). It was thus considered a suitable measure for having developed higher levels of resilience following life experiences.

An exploratory factor analysis suggested that the CD-RISC might be assessing five main factors associated with resilience: (1) personal competence/tenacity, (2) trust in one's instincts/tolerance of negative affect, (3) positive acceptance of change/secure relationships, (4) control, and (5) spirituality. However, the reliability and validity of the subscales have not been consistently established (Sexton, Byrd & Kluge, 2010). Therefore, only CD-RISC

total scores were used in this study and the remainder of the thesis. Total scores

were derived by summing up all items, with a possible range of 0-100. Higher

scores represented having developed higher levels of resilience. Within a sample

of 1,644 individuals from the general population an alpha coefficient of 0.89 was

reported (Connor & Davidson, 2003).

3.1.2.1.3   Procedure

Following informed consent, all participants filled out a demographic

questionnaire where they reported their age, ethnicity, gender and whether they

spoke English as a first language. The experiment involved two major tasks which

were counterbalanced. Task one included filling in the self-report questionnaires

assessing trait anger, trait anxiety, trait depression, rumination and resilience.

Task two comprised rating the ten-second videos (see Section 3.1.1.).

For task 2, before viewing the videos, participants were told to imagine they

were the main character in the scene or related to the main character in some way,

for example as a passer-by or a friend. These instructions remained on screen for

500 milliseconds. The video clip was then played. The order of videos was

randomised. After each clip, participants were presented with three consecutive

scales on which they rated how angry, anxious and sad they would feel within the

roles they had been asked to adopt. Scales were presented on screen in a random

order. As soon as the participant answered one scale, it was replaced by another

scale until all three scales were answered. The instructions related to the next

video then appeared, and again remained on screen for 500 milliseconds.

Participants' ratings on all three scales and the speed with which they gave these

ratings were recorded. Henceforth, angry cognitive appraisals will be referred to

as angrat; anxious cognitive appraisals will be called anxrat and sad cognitive

appraisals will be sadrat.

3.1.2.1.4   Data analysis

The Kolmogorov-Smirnov test and visual inspection of the histograms

revealed that scores on several of the measures were significantly skewed (Field,

2013). This was anticipated based on the non-clinical nature of the sample

(Spielberger et al., 1983). Logarithmic transformations successfully removed the

skews on trait depression, angrat, anxrat and sadrat (Pallant, 2007). However, the

other variables remained skewed, even after the removal of outliers. Therefore,

Spearman's rho was applied to evaluate correlations.

Mediation analyses were performed to assess the influence of negative

cognitive appraisals and rumination scores on the relationship between the three

negative trait emotions and resilience. This analysis was chosen because it

enables an assessment of the extent to which "the relationship between a predictor

and outcome variable can be explained by their relationship to a third variable

(the mediator)" (Field, 2013, p. 408). It also allows for the comparison of the

influence of different mediators on the same relationship (Field, 2013; Shrout &

Bolger, 2002) which was the main aim of the intended analysis. The mediation

analyses were performed using the PROCESS programme (Preacher & Hayes,

2004; 2008a) within SPSS (19.0, IBM statistics). This programme was selected

because it adjusts for highly correlated variables as is the case in the current study

(see Table 3.2) (Preacher & Hayes, 2004; 2008a).

Due to the non-normal distribution within the sample, bootstrapping was

used for the mediating analyses (Hood, Pulvers, Carrillo, Merchant & Thomas,

Table 3.2.

Correlations between negative trait emotions, negative cognitive appraisals (emotion ratings), rumination and resilience

Variable	1	2	3	4	5	6	7	8
(1) Trait anger		0.29^{**}	0.26^{**}	0.19*	0.18	0.05	0.33^{**}	-0.21^{*}
(2) Trait anxiety			0.41^{**}	0.06	0.20*	0.14	0.29^{**}	-0.36^{**}
(3) Trait depression				0.10	0.13	0.21*	0.37^{**}	-0.29^{**}
(4) Angrat					0.34**	0.42**	0.20*	-0.00
(5) Anxrat						0.01	0.10	-0.06
(6) Deprat							0.18	-0.01
(7) Rumination								-0.32^{**}
(8) Resilience								

Notes: $^{***}p < .001$, $^{**}p < 0.01$, $^{*}p < 0.05$

2012; McCuaig Edge & Ivey, 2012; Raes, 2010). Bootstrapping is a non-parametric procedure which develops a sampling distribution of the parameter pertinent to the analysis (in this case, regression bs) using resamples from the data being analysed. Its results display the 95% confidence intervals for the parameter of interest derived from this sampling distribution. If the confidence intervals do not include zero, it can be concluded that a partial mediation exists (Preacher & Hayes, 2004; 2008a; Shrout & Bolger, 2002). The bias corrected and accelerated method of bootstrapping was applied to the mediation analyses as this is considered a more conservative procedure (Shrout & Bolger, 2002). In addition, in accordance with the recommendations of Shrout and Bolger (2002), 5,000 resamples were used. Three mediation models were analysed as detailed in Table 3.3. Control variables were used based on previous research (Raes, 2010).

Table 3.3.

The mediation analyses being performed in Study 1

Mediation analysis	Independent variable	Mediator variables	Dependent variable	Control variables
(1)	Trait anger	Rumination Angrat	Resilience	Trait anxiety Trait depression
(2)	Trait anxiety	Rumination Anxrat	Resilience	Trait anger Trait depression
(3)	Trait depression	Rumination Sadrat	Resilience	Trait anger Trait anxiety

3.1.2.2. **Results**

3.1.2.2.1   Descriptive statistics

Means, standard deviations and ranges are reported in Table 3.4. For all five

scales (the three negative trait emotion measures as well as the rumination and

resilience measures), the means of the current sample were generally comparable

to prior research in similar undergraduate populations (Bitsika, Sharpley& Peters,

2010; Culhane & Morera, 2010; Litman, Collins & Spielberger, 2005; Roger &

Najarian, 1989; Spielberger, 1999; Spielberger et al., 1983; Spielberger et al.,

1995). Within the table, the means of the intensity and speed of ratings are

reported separately to facilitate the interpretation of the data.

3.1.2.2.2   Preliminary analyses

Based on the small and unequal sample sizes, Mann-Whitney U tests and

Kruskall-Wallis tests were used to evaluate the impact of gender and ethnicity

respectively. No significant differences emerged for any of the variables (see

Appendix B).

3.1.2.2.3   Correlations

Table 3.2 showed the correlations between trait anger, trait anxiety, trait

depression, the potential mediators and resilience. As anticipated, scores on each

negative trait emotion measure were significantly positively correlated with trait-

congruent automatic cognitive appraisals (emotion ratings) and with rumination

scores as well as significantly negatively correlated with scores on the resilience

measure. Rumination scores were also significantly negatively correlated with

Table 3.4.

Means, SD and Ranges for the predictor, mediator and outcome variables in

Study 1

Variable	M	SD	Range
Trait anger	19.03	4.17	11.00 – 29.00
Trait anxiety	40.59	9.05	22.00 – 68.00
Trait depression	18.71	4.58	11.00 – 33.00
Rumination	5.94	3.00	0.00 – 13.00
Resilience	69.67	10.53	40.00 – 98.00
Intensity of anger ratings	2.38	0.64	1.13 – 4.54
Intensity of anxiety ratings	3.14	0.80	1.46 – 4.92
Intensity of depression ratings	2.42	0.64	1.52 – 5.21
Speed of anger ratings	1,818.10ms	740.38ms	467.67ms – 4,936.38ms
Speed of anxiety ratings	1,697.08ms	722.98ms	476.38ms – 4,448.83ms
Speed of depression ratings	2,409.32ms	1,044.47ms	274.33ms – 5,304.67ms

scores on the resilience measure. However, contrary to the hypotheses, there was

no relationship between any of the automatic negative cognitive appraisals

(emotion ratings) and resilience scores.

Based on the absence of significant correlations between the automatic

negative cognitive appraisals (emotion ratings) and resilience, the mediations

focused on evaluating the impact of rumination. This was done because a

significant relationship between the potential mediator and the dependent variable

is a prerequisite for running a mediation analysis (Field, 2013).

3.1.2.2.4   *Mediation analyses*

Three mediation analyses were performed. The results of these analyses are

presented in Figure 3.2 where standardised regression coefficients are reported.

In the first mediation analysis (mediation analysis 1 in Table 3.2), resilience

was entered as the dependent variable, trait anger was the independent variable

and rumination was the potential mediator. Based on the correlations, trait

anxiety, trait depression and angry cognitive appraisals were entered as control

variables (Raes, 2010). The 95% confidence interval (CI) for rumination was -

0.33 and   -0.03. As zero was not included in this 95% CI, it can be concluded

that rumination partially mediated the modest relationship between trait anger and

resilience. The model explained 18.38% of the variance in participants' resilience

scores.

In the second analysis (mediation analysis 2 in Table 3.2), resilience was the

dependent variable, trait anxiety was the independent variable and rumination was

entered as the potential mediator. Trait anger, trait depression and angry cognitive

appraisals were entered as control variables (Raes, 2010). The 95% CI for

rumination was -0.10 and -0.02. The results show that rumination partially

mediated the significant relationship between trait anxiety and resilience as its

interval did not include zero. The model explained 18.38% of the variance in

participants' resilience scores.

In the third analysis, resilience was the dependent variable, trait depression

was the independent variable and rumination was the potential mediator. Trait

anger, trait anxiety and angry cognitive appraisals were entered as control

variables (Raes, 2010). The 95% CI for rumination was -0.24 and -0.33. It can be

concluded that rumination partially mediated the significant relationship between

trait depression and resilience as zero was not included in its interval. The model

explained 18.38% of the variance in participants' resilience scores.

Rumination

.33**   -.32**

Trait anger   Resilience

-.21* (-.12)

Rumination

.29**   -.32**

Trait anxiety   Resilience

-.36*** (-.29**)

Rumination

.37***   -.32**

Trait depression ──────────────────────────────► Resilience

-.39*** (-.19*)
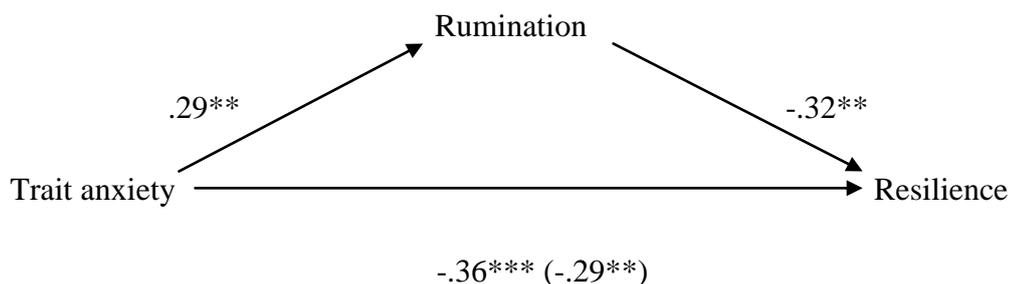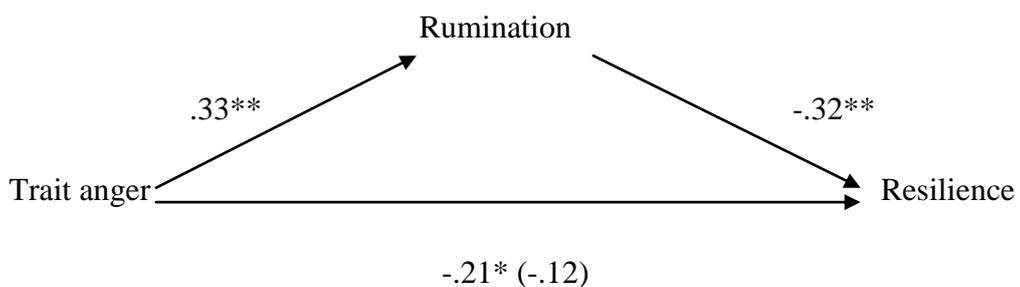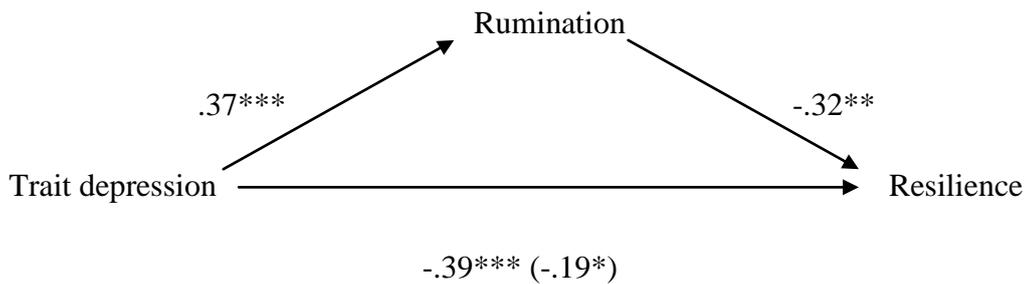
Figure 3.2. Results of the mediation analyses.

3.1.2.3.   *Discussion and Conclusions*

In support of the hypothesis, higher scores on all three negative trait emotions were significantly negatively correlated with resilience. This corroborates prior findings linking negative trait emotion to lower levels of resilience (Fox & Spector, 1999; Manasse & Ganem, 2009; Moosbrugger & Schermelleh-Engel, 1991) and suggests that students with high levels of negative trait emotion are likely to have difficulties adjusting to university life.

As anticipated, higher scores on the negative trait emotion measures were associated with greater rumination scores and greater rumination scores were negatively correlated with resilience. In addition, rumination was found to partially mediate the relationship between all three negative trait emotions and resilience. These results support prior findings concerning the harmful influence of negative thinking styles on individuals' levels of resilience (Nolen-Hoeksema, 1991; Roger & Najarian, 1989; Salsman et al., 2009). They also highlight this second pathway as potentially exerting a significant impact on the levels of resilience of students high on negative trait emotion.

This is further bolstered by the fact that the hypotheses related to the negative cognitive appraisals were not all supported. On the one hand, as

anticipated, levels of negative trait emotion were significantly positively
correlated with trait-congruent automatic cognitive appraisals (trait-congruent
emotion ratings). These results validate the trait congruent hypothesis (MacLeod
& Rutherford, 1992; Parrot et al., 2005; Wilkowski & Robinson, 2008). On the
other hand, these negative cognitive appraisals were not significantly related to
resilience. These results contradict the stated hypotheses. Instead, they provide
support for existing findings which suggest that the experience of negative
emotion does not hinder the levels of resilience that individuals can attain (Hunter
& Chandler, 1999; Rutter, 2007). This therefore suggests that the difficulties
adjusting to university life that students high on negative trait emotion may
experience is not caused by their tendency to respond to events with intense
negative emotion.

However, the results highlight the need for additional research to support
this postulation: angry cognitive appraisals were significantly related to the
rumination measure which suggests that these appraisals may be exerting an
indirect impact on students' resilience through their negative thinking styles. As
such, the next study will explore the relationship between angry cognitive
appraisals and rumination to determine whether these processes interact to
influence the association between trait anger and resilience.

3.2   Study 2: An assessment of the relationship between negative cognitive appraisals and negative thinking styles

This study explores the significant positive correlations that emerged
between angry cognitive appraisals and rumination. These findings suggested that
angry cognitive appraisals may influence resilience indirectly through rumination.

The interaction between angry cognitive appraisals and rumination was not

evaluated in the previous analysis. Therefore, one of this study's main aims is to

evaluate whether the following three-path mediating effect exists: trait anger →

angry cognitive appraisals → rumination → resilience.

Research has supported this relationship. For instance, Fredrickson (2001)

argues that negative emotions may hinder the building of resilience by

"narrowing" individuals' thinking, causing them to focus on negative and

pessimistic thoughts (p. 9). She thus puts forth a relationship between negative

emotions and negative thinking, highlighting this relationship as the cause for

lower levels of resilience. However, research has also suggested that angry

cognitive appraisals and the emotions they generate may not exert any influence

on how individuals high on trait anger adjust to their experiences (Fox & Spector,

1999).

Fox and Spector (1999) assessed the relationship between trait anger and

adjustment to poor quality work environments among 185 employees from 8

American industries. Adjustment was evaluated by assessing the frequency with

which employees engaged in counterproductive work behaviours such as having

"taken any kind of drug at work to get high (including alcohol)". They

specifically assessed the mediating impact of the negative emotion - "frustration"

- on the frequency with which employees high on trait anger engaged in such

counterproductive work behaviours. Frustration was evaluated using items such

as "Trying to get this job done is a very frustrating experience" on a 6-point

Likhert scale. The researchers found that frustration levels did not mediate the

relationship between trait anger and counterproductive work behaviour. Their

findings therefore suggest that trait anger may in fact exert an impact on adjustment outside of the influence of angry cognitive appraisals and the intense anger they generate. However, these researchers evaluated the broader negative emotion of "frustration" instead of anger, which is the focus of the current analysis.

The present study also further analyses the partial mediating influence of rumination that emerged in Study 1. This was done because the PROCESS programme that was used for the mediation analyses does not definitively distinguish between partial and full mediations (Raes, 2010). The PROCESS programme was chosen because such regression analyses are recommended for preliminary exploration of mediating relationships. This is because for multiple mediation models (models with more than on mediating variable), regressions perform all possible pairwise contrasts between the indirect effects being proposed, that is, they assess and contrast the impact of all potential mediators. They are thus ideal when comparing the impact of competing mediating effects (as was done in the previous analysis) as they enable deeper insight into which are the most significant mediating relationships.

However, these regression analyses prevent researchers from distinguishing between a "true" indirect effect and a "spurious" indirect effect (National Institute of Child Health and Human Development (NICHD) Early Childcare Research Network, 2002). Therefore, it is recommended that significant mediating relationships derived from regression analyses should be confirmed using further tests (NICHD Early Childcare Research Network, 2002). As such, in order to determine whether a full mediation exists, the significant partial mediations for

trait anger, trait anxiety and trait depression were assessed using path analysis.

Path analysis was chosen because of the complexity involved in assessing such

three path mediating effects as the one being evaluated in this study (trait anger→

angry cognitive appraisals→ rumination → resilience) (Iacobucci, 2008; King,

King, Foy, Keane & Fairbank, 1999). It was hypothesised that rumination would

partially mediate the relationships between trait anger/trait anxiety/trait

depression and resilience.

3.2.1.   Method

This study utilised the 106 participants (53 males and 53 females) and

measures from Study 1. Path analysis was performed using AMOS (version 19;

IBM software) with the maximum likelihood estimation technique (ML;

Arbuckle, 2010). ML uses the chi-square statistic (χ^2) to assess the goodness of fit

of the hypothesised model. χ^2 compares the covariances predicted by the model to

the covariances derived from building a model that perfectly fits the data. It

evaluates the null hypothesis that the proposed model is a good fit to the data and

thus sampling error or chance causes the insignificant differences between the two

covariance matrices. Therefore, a significant probability value shows that the

model is a poor fit to the data and should be rejected (Kline, 2011). However, χ^2 is

sensitive to characteristics of the sample, such as sample size and violations of

normality (Byrne, 2001; Simon & Tovar, 2004; Kline, 2011). Therefore, given the

violation of normality within the current data set, it was anticipated that χ^2 may

erroneously suggest that the model should be rejected.

As a result, in addition to χ^2, four approximate fit indices (AFIs) were used

as these are less affected by sample characteristics. Four main types of AFIs exist:

(1) absolute fit indices which evaluate whether the model explains a significant

proportion of the variance within the data set; (2) incremental or comparative fit

indices which compare the proposed model to a "baseline" model characterised

by data that has no covariances; (3) parsimony-adjusted indices which choose the

simpler of the two models being compared as providing the better fit to the data;

and (4) predictive fit indices which compare the model to a hypothetical model

derived from drawing samples randomly from the data set.

As recommended by Kline (2011), one of each of these AFIs were chosen:

(1) Comparative Fit Index (CFI), (2) Tucker-Lewis Index (TLI), (3) Root Mean

Square Error of Approximation (RMSEA) and (4) Akaike Information Criterion

(AIC) described as "the best known predictive index under ML estimation"

(Kline, 2011, p. 220). A cut-off of 0.95 was used for the CFI and the TLI, as for

these AFIs values closer to 1.00 indicate a better fit (Hu & Bentler, 1999; Kline,

2011). For the RMSEA, values ≤ 0.05 indicate close approximate fit, values

between 0.05 and 0.08 suggest reasonable fit, and values ≥ 0.10 suggest poor fit.

Therefore, a cut-off of 0.05 was used. With the AIC, values for all models were

compared and the model with the lowest AIC was labelled the best fit to the data.

Based on the significant correlation between angry cognitive appraisals and

rumination (see Table 3.2), the fit of the hypothesised model for trait anger –

rumination partially mediates the relationship between trait anger and resilience

(Figure 3.3) – was compared to the fit of two alternative theoretically derived

nested models (Figures 3.4 and 3.5). The first competing model (Figure 3.4)

hypothesised that rumination fully mediates the relationship between trait anger
and resilience. The second competing model (Figure 3.5) hypothesised that angry
cognitive appraisals trigger rumination and this interaction mediates the
relationship between trait anger and resilience. For trait anxiety and trait
depression, the fit of the hypothesised model – rumination partially mediates the
relationship between trait anxiety and resilience as well as between trait
depression and resilience (see Figure 3.3) – was compared to the fit of one
alternative theoretically derived nested model (see Figure 3.4). This competing
model hypothesised that rumination fully mediates the relationship between trait
anxiety and resilience as well as between trait depression and resilience.
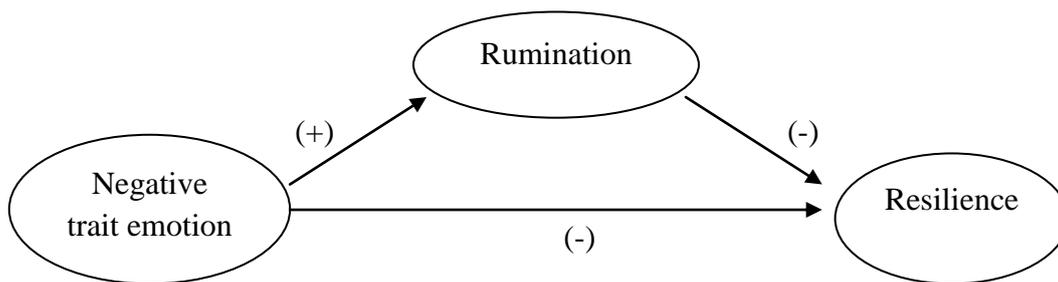
Figure 3.3. The hypothesised partial mediation model proposed for trait anger,
trait anxiety and trait depression.
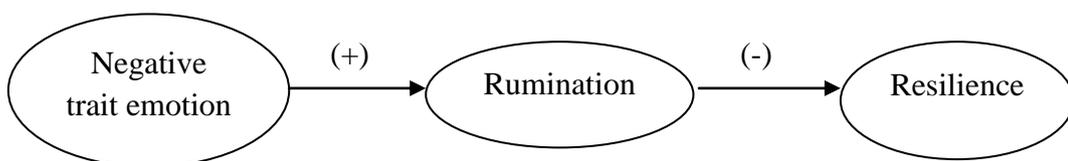
Figure 3.4. The full mediation model proposed for trait anger, trait anxiety and
trait depression.
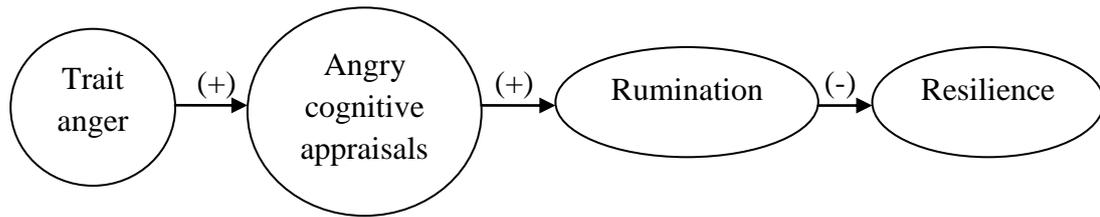
Figure 3.5. The three path mediating model proposed for trait anger.

These comparisons were done using sequential χ^2 difference tests
(Anderson & Gerbing, 1988; Byrne, 2010; Houghton & Jinkerson, 2007).
Sequential χ^2 difference tests compare the fit of the hypothesised models to the
competing model(s) and determine whether they significantly differ on the χ^2
statistic and the four AFIs described above (Anderson & Gerbing, 1988;
Houghton & Jinkerson, 2007). According to Houghton and Jinkerson (2007), if
the fit indices significantly differ, the better fitting model is retained. However, if
the fit indices are not significantly different (their values remain unchanged or
only slightly worsen), this means that there is little difference between the two
models being compared and thus the more parsimonious of the two should be
retained.

3.2.2. Results

3.2.2.1.   *Descriptive statistics*

Means, standard deviations and ranges are reported in Table 3.3.

3.2.2.2.   *Preliminary analyses*

Data were assessed against the assumptions for path analysis (Kline, 2011).
These are discussed in detail below:

(1)   Temporal precedence exists, that is, the cause (X) precedes the effect (Y).
Within this study there was no temporal precedence. However, Kline states that
when temporal precedence is absent, valid results can be assured when there is "a
clear, substantial rationale...for specifying that X is a cause of Y" (Kline, 2011, p.
113). Evidence in support of this can be found in Sections 1.2 and 1.5 which
presented studies linking negative trait emotion to resilience and cognition
respectively. In addition, evidence in support of the relationship between angry
cognitive appraisals and resilience as well as between rumination and resilience
was presented in Sections 1.4.2.3 and 1.4.2.4. Lastly, evidence linking angry
cognitive appraisals to rumination emerges from the postulations of Fredrickson
(2001) as detailed in the review of the current study.

(2)   There is covariation between X and Y. Evidence of this relationship can be
found in Table 3.2. Here it was shown that trait anger, trait anxiety and trait
depression were all significantly positively related to rumination and
significantly negatively related to resilience while angry cognitive appraisals were
significantly positively related to trait anger and rumination. In addition,
rumination was significantly negatively related to resilience.

(3)   There are no other plausible explanations of the covariation that exists
between X and Y. Evidence in support of this was detailed in Section 1.3 where
the influence of cognition and alternative factors on resilience was compared and
Section 1.5 where the influence of cognitive processes on the relationship
between negative trait emotion and resilience was discussed.

(4)   The distribution meets the assumption of the test being used. Path analysis
requires a normal distribution. As discussed in Study 1, however, within the
current data set this assumption has been violated. Therefore, bootstrapping was

performed using the maximum likelihood estimation method with 2,000

resamples (Byrne, 2010; Kline, 2011; Utsey, Bolden, Lanier & Williams, 2007).

(5)   The direction of the causal relationship is correctly specified. Evidence in

support of this was provided in three sections. Section 1.2 detailed the

relationship between negative trait emotion and resilience; Section 1.4 discussed

the relationship between cognition and resilience and Section 1.5 described the

relationship between negative trait emotion and cognition. In addition, evidence

in support of the direction of the causal relationship between angry cognitive

appraisals and rumination can be derived from the postulations of Fredrickson

(2001) as detailed in the review of the current study.

3.2.2.3.   Path analyses

3.2.2.3.1.   Trait anger

Fit indices for the three models that were compared for trait anger are

presented in Table 3.5. The results suggested that the full mediation model (see

Figure 3.5) presented the best fit to the data, χ^2 [3, N=106] = 5.65, p =.130,

TLI=0.79, CFI=0.89, RMSEA=0.09, AIC=19.65. However, the χ^2 difference test

hinted that there were no significant differences in the fits of this full mediation

model and the hypothesised partially mediated model shown in Figure 3.4, χ^2_{diff} =

1.42, p = .147. This meant that this hypothesised model may also provide a

comparable fit to the data, χ^2 [2, N=106] = 4.23, p=.120, TLI=0.73, CFI=0.91,

RMSEA=0.10, AIC=20.23, although the model fit remained weak.

According to Houghton and Jinkerson (2007), this meant that the more

parsimonious model (the full mediation model) should be retained. As a check of

this, based on the suggestions of Byrne (2010), the relevance of the paths that

differ between the models was examined. This meant that the path between trait

anger and resilience, the only difference between the two models, was reviewed

(Byrne, 2010). This parameter did not emerge as significant ($p =$.232). Thus, the

full mediation model was retained, suggesting that rumination fully mediates the

relationship between trait anger and resilience. The standardised solution for the

model is shown in Figure 3.6, with measurement error effects omitted for clarity

(Houghton & Jinkerson, 2007).
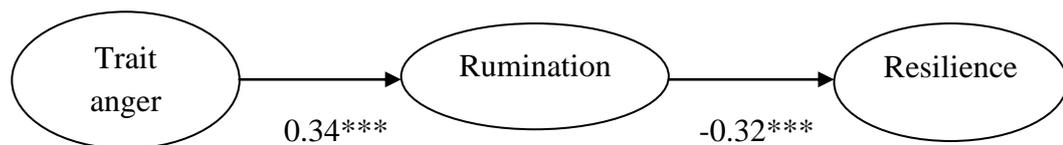
Figure 3.6. The best fitting model regarding the cognitive processes mediating the

relationship between trait anger and resilience.

3.2.2.3.1.   *Trait anxiety*

For trait anxiety, assumption 2 (see Section 3.2.2.2) was not met for the

relationship between anxious cognitive appraisals and rumination (see Table 3.4).

As such, the partial mediation model (see Figure 3.3) was compared to the full

mediation model (see Figure 3.4).

Fit indices are presented in Table 3.6. The results suggested that the

hypothesised mediation model presented the better fit to the data, χ^2 [2, N=106] =

2.42, $p=$.299, TLI=0.96, CFI=0.99, RMSEA=0.05, AIC=18.42. This was further

supported by the results of the χ^2 difference test which highlighted this model as

Table 3.5

Summary of the goodness of fit indices for the hypothesised and competing models for trait anger

Models	χ^2 (df)	Goodness of fit statistics				χ^2 difference (df)
		TLI	CFI	RMSEA (90% CIs)	AIC	
Optimal value	Non-significant	≥0.95	≥0.95	≤0.05	Lowest value	
Partial mediation model	4.23 (2)	0.73	0.91	0.10 (0.00 - 0.24)	20.23	
Full mediation model	5.65 (3)	0.79	0.89	0.09 (0.00 - 0.20)	19.65	1.42(1)
Three-path mediation model	12.85**(3)	0.20	0.60	0.18 (0.09- 0.28)	26.85	7.20* (1)

Notes: ** $p < 0.01$, * $p < 0.05$

a significantly better fit to the data than the full mediation model, $\chi^2_{diff} = 9.74$, p <.01. Therefore, the hypothesised model was retained, suggesting the presence of a partially mediated relationship between trait anxiety and resilience through rumination. The standardised solution for the model is shown in Figure 3.7. Within the figure, measurement error effects are omitted for clarity (Houghton & Jinkerson, 2007).
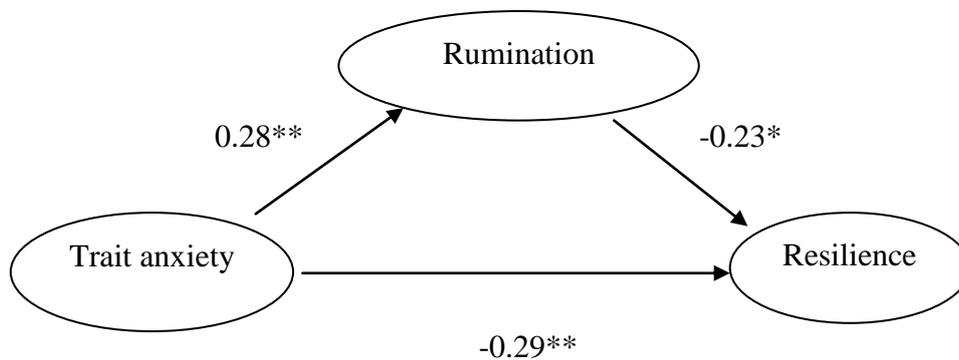
Figure 3.7. The better fitting model regarding the cognitive processes mediating the relationship between trait anxiety and resilience.

3.2.2.3.1.   *Trait depression*

For trait depression, assumption 2 (see Section 3.2.2.2) was not met for the relationship between sad cognitive appraisals and rumination (see Table 3.4). As such, the hypothesised partial mediation model (see Figure 3.3) was compared to the full mediation model (see Figure 3.4).

Fit indices are presented in Table 3.7. The results suggested that the hypothesised model presented the better fit to the data, χ^2 [2, N=106] = 1.20, p=.158, TLI=1.09, CFI=1.00, RMSEA=0.00, AIC=17.20. This was further supported by the results of the χ^2 difference test

Table 3.6

Summary of the goodness of fit indices for the hypothesised and competing models for trait anxiety

Models	χ^2 (df)	TLI	CFI	RMSEA (90% CIs)	AIC	χ^2 difference (df)
Optimal value	Non-significant	≥0.95	≥0.95	≤0.05	Lowest value	
Partial mediation model	2.42 (2)	0.96	0.99	0.05 (0.00- 0.20)	18.42	
Full mediation model	12.16** (3)	0.36	0.68	0.17 (0.07 - 0.27)	26.16	9.74**(1)

Notes: ** $p < 0.01$.

which highlighted this model as a significantly better fit to the data than the full

mediation model, $\chi^2_{\text{diff}} = 4.92$, $p < .05$. Therefore, the hypothesised model was

retained, suggesting the presence of a partially mediated relationship between trait

depression and resilience through rumination. The standardised solution for the

model is presented in Figure 3.8. Measurement error effects are omitted for clarity

(Houghton & Jinkerson, 2007).
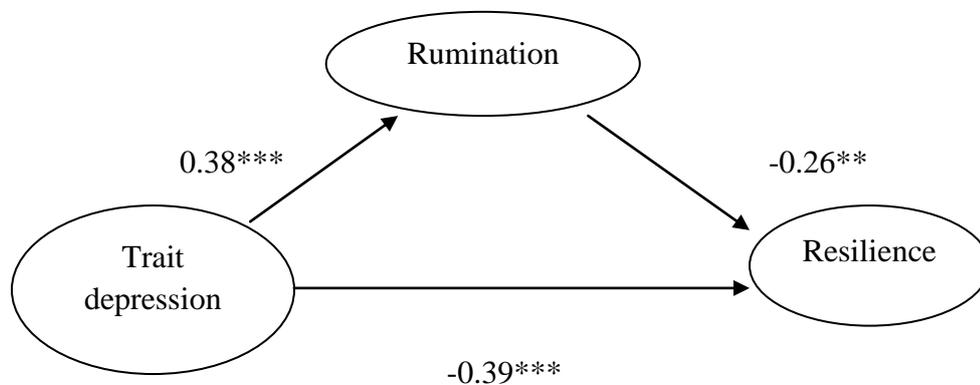
Figure 3.8. The better fitting model regarding the cognitive processes mediating

the relationship between trait depression and resilience

Table 3.7

Summary of the goodness of fit indices for the hypothesised and competing models for trait depression

Models	χ^2 (df)	TLI	CFI	RMSEA (90% CIs)	AIC	χ^2 difference (df)
Optimal value	Non-significant	≥0.95	≥0.95	≤0.05	Lowest value	
Partial mediation model	1.20 (2)	1.09	1.00	0.00 (0.00 - 0.17)	17.20	
Full mediation model	6.12 (3)	0.89	0.90	0.25 (0.00 - 0.17)	19.62	4.92* (1)

3.2.3.   Discussion and Conclusions

This study was performed to assess the impact of the relationship between angry cognitive appraisals and rumination as well as to further evaluate the mediations that emerged in Study 1. The results showed that rumination partially mediated the relationship between trait anxiety/trait depression and resilience but fully mediated the relationship between trait anger and resilience. These findings partially supported the hypotheses.

The absence of an impact of angry cognitive appraisals supported the hypotheses as well as additional research which has found that angry cognitive appraisals and the emotions they generate may not exert any influence on how individuals high on trait anger adjust to their experiences (Fox & Spector, 1999). In addition, the partial mediation of rumination that emerged for trait anxiety and trait depression confirmed the hypotheses. This supports the postulations made in Chapter 1 where it was asserted that negative thinking styles influence, but do not fully explain, the relationship between negative trait emotion and resilience.

For trait anger, the full mediation of rumination did not confirm the hypothesis. This suggests that any difficulties adjusting to university life experienced by students high on trait anger may be associated with their negative thinking styles which lead them to continuously focus on the negative and upsetting aspects of their university experiences. In support of this, such continuous ruminations have been described by researchers as the mechanisms through which individuals may eventually "explode" (Davey, Howells and Day, 2005, p. 626), highlighting their poor adjustment to the particular experience.

It should be noted, however, that while the hypothesised model emerged as
the best fitting among the three models evaluated, the findings suggested that it
nonetheless provided a weak fit. This may have been attributed to the small
sample size utilised within the path analyses performed. According to some
researchers (Schreiber, Nora, Stage, Barlow & King, 2006), a minimal sample
size of 10 participants per estimated parameter is required for path analyses.
Within the current study, this suggested sample size was matched (the
hypothesized partial mediating model boasted a participant ratio of 26.5
participants to 1 parameter estimated), adding confidence to the results obtained.
However, other researchers (Kline, 2011) argue that at least 200 participants
should be used to maximise the efficiency within path analyses. The current
sample size was 106 university students, suggesting that in line with these
postulations, the weak fit of the hypothesized model may have been caused by the
small sample size used.

The current findings suggest that the remaining analyses should focus on
exploring the influence of longer term thinking patterns. Rosenberg (1998)
specifically argues that negative trait emotion is associated with trait-congruent
cognitive processes. Therefore, the next study will explore whether negative trait
emotion exerts its impact through trait-congruent negative thinking styles by
incorporating an additional measure of longer term negative thinking patterns.

3.3   Study 3: An examination of the trait-congruent hypothesis in relation to negative thinking styles

This study is performed based on the previous findings of Study 2. Here, it
was found that longer term cognitive processes (assessed with a measure of

rumination) influenced the relationship between all three negative trait emotions
and resilience. According to Rosenberg (1998), negative trait emotion exerts its
influence through trait-congruent cognitive processes. However, evidence
supporting the relationship has been derived mainly from studies into automatic
cognitive processes (Honk, Tuiten, Haan, Hout & Stam, 2001; MacLeod &
Rutherford, 1991; Parrot et al., 2005). Conversely, research into longer term
thinking patterns has provided limited support for this trait-congruent hypothesis
(Berry et al., 2005). Therefore, confidence in the relationship between negative
trait emotion and trait-congruent thinking styles is limited. The current analysis
thus evaluated whether trait anger, trait anxiety and trait depression were related
to trait-congruent patterns of negative thinking styles by incorporating a measure
of future-oriented thinking (worry).

Negative correlations were anticipated between all three negative trait
emotions and resilience. It was hypothesised that rumination and worry will be
positively correlated with all three negative trait emotions and negatively
correlated with resilience. However, based on findings describing worry as an
anxiety-congruent thinking pattern (Borkovec et al., 1998; Starcevic et al., 2007),
significant partial mediations were hypothesised as follows: (1) trait anger/trait
anxiety/trait depression → rumination→ resilience and (2) trait anxiety → worry
→ resilience.

3.3.1. Method

3.3.1.1.   Participants

A new sample of students was recruited for this study using the online
participant pool managed by the Psychology Department within the University of

York. This sample comprised 235 students (41 males and 194 females). They

received either course credit or payment in return for their participation. The

sample was predominantly White British students (65.1%) with comparable

amounts of Chinese and non-UK European students (15.3% and 13.6%

respectively). The remainder of the sample comprised Asian British (2.1%),

African/Caribbean (0.9%), Black British (0.4%), White American (1.3%) and

Mixed (1.3%) students. The mean age of the sample was 20.85 years (Range = 18

- 46).

3.3.1.2.   Materials and apparatus

(1) As in Study 1, the same three negative trait emotion measures were used

to assess trait anger (STAXI-II; Spielberger, 1999), trait anxiety (STAI;

Spielberger et al., 1983) and trait depression (STPI-TD; Spielberger et al., 1995).

(2) Rumination was assessed using the Rehearsal subscale of the most

recently revised version of the Emotion Control Questionnaire (ECQ3; Roger,

Guarino de Scremin; Borril & Forbes, 2011; see Appendix A6). It used 18

dichotomous (*true/false*) items (e.g. "I remember things that upset me or make me

angry for a long time afterwards") to assess individuals' tendency to ruminate

over emotionally upsetting events. Five items within the measure were reverse-

scored. Higher scores reflected a greater tendency to engage in rumination with a

total possible score of 18. Research within a similar undergraduate population

documented a large alpha coefficient of 0.84 (Roger et al., 2011).

(3) The Worry Domains Questionnaire (WDQ; Tallis, Eysenck, &

Mathews, 1992; see Appendix A7) was used to evaluate worry. Participants rated

25 items on the degree to which these items reflected the content of their worries

about relationships, lack of confidence, aimless future, work incompetence and

finances on a 5-point scale ranging from 0 (*not at all*) to 4 (*extremely*). Total

scores were calculated by summing up all items, with a total possible score of

100. Higher scores on the measure indicated more frequent worrying about topics

such as "losing close friends" and "being unattractive to the opposite sex". The

measure showed good internal validity (alpha = 0.91) in a similar university

student population (Davey, 1993).

(4) Resilience was assessed with the CD-RISC (Connor & Davidson, 2003)

that was used in Study 1.

3.3.1.3.   Procedure

The questionnaires were all administered online as part of a battery of

measures, the remainder of which are reported in Chapter 4 of the thesis.

Participants were emailed the link to the survey. The survey began by informing

participants about the questions they will be completing and asking them to give

their informed consent by entering their email addresses. This entry then allowed

them to begin filling in the various measures.

3.3.1.4.   Data analysis

The preliminary analyses revealed that scores on all the measures were

significantly skewed. Again, this was anticipated based on the non-clinical nature

of the sample (Spielberger et al., 1983). Logarithmic transformations successfully

removed the skew on trait anxiety. However, the other variables remained

significantly skewed, even after the removal of outliers.

Therefore, similar to Study 2, Spearman's rho was applied to evaluate the

correlations. In addition, bootstrapping with the biased and accelerated method

(5,000 resamples) was applied to the mediation analyses. The mediation analyses

were performed using the PROCESS programme (Preacher & Hayes, 2004;

2008a) within SPSS (19.0, IBM Statistics). Three mediation analyses were

performed as depicted in Table 3.8. Control variables were used based on

previous research (Raes, 2010).

Table 3.8.

The mediation analyses being performed within in Study 3

Mediation analysis	Independent variable	Mediator variables	Dependent variable	Control variables
(1)	Trait anger	Rumination Worry	Resilience	Trait anxiety Trait depression
(2)	Trait anxiety	Rumination Worry	Resilience	Trait anger Trait depression
(3)	Trait depression	Rumination Worry	Resilience	Trait anger Trait anxiety

3.3.2. Results

3.3.2.1.   Descriptive statistics

Means, standard deviations and ranges are reported in Table 3.9. Similar to

Study 1, the means on the negative trait emotion and resilience measures were

generally comparable to prior research in similar undergraduate populations
(Bitsika, Sharpley& Peters, 2010; Culhane & Morera, 2010; Litman, Collins &
Spielberger, 2005; Roger & Najarian, 1989; Spielberger, 1999; Spielberger et al.,
1983; 1995). For rumination and worry, the means were also comparable to prior
studies using undergraduates (Roger et al., 2011; Stöber, 1998; Stöber &
Joorman, 2001).

Table 3.9.

*Means, standard deviations and ranges for the predictor and outcome variables
in Study 3*

Variable	M	SD	Range
Trait anger	14.38	4.40	8.00 – 31.00
Trait anxiety	42.37	9.69	22.00 – 72.00
Trait depression	18.79	5.46	10.00 – 36.00
Rumination	7.36	3.80	0.00 – 18.00
Worry	36.30	21..7	0.00 – 100.00
Resilience	63.50	11.66	28.00 – 91.00

3.3.2.2.   Preliminary analyses

Mann-Whitney U tests did not reveal significant gender differences (see
Appendix C). However, Kruskall-Wallis tests (see Appendix C) showed that
White American students had significantly higher levels of resilience than Asian
British students, H (7) =-3.25, p=.032. Therefore, ethnicity was entered as a
control variable in the mediation analyses.

3.3.2.3.   *Correlations*

Table 3.10 shows the correlations between trait anger, trait anxiety, trait

depression, rumination, worry and resilience scores. As hypothesised, all the

negative trait emotions were significantly negatively related to resilience and

significantly positively related to rumination and worry. In addition, rumination

and worry were significantly negatively related to resilience. Based on these

correlations, all three mediation analyses were performed.

Table 3.10.

Correlations between negative trait emotions, rumination, worry and resilience

Variable	1	2	3	4	5	6
(1) Trait anger		0.28**	0.25**	.31**	.28**	-0.15*
(2) Trait anxiety			0.82***	.73***	.67***	-0.66***
(3) Trait depression				.64***	.63***	-0.52**
(4) Rumination					.59***	-0.49**
(5) Worry						-0.49**
(6) Resilience						

Notes: **** $p < .001$, * $p < 0.01$, * $p < .05$.

3.3.2.4.   *Mediation analyses*

Three mediation analyses were performed (see Table 3.8). The significant

mediations are presented in Figure 3.9 below where standardised regression

coefficients are reported.

In the first mediation analysis (mediation analysis 1 in Table 3.8), resilience

was entered as the dependent variable, trait anger was the independent variable

and rumination and worry were the potential mediators. Trait anxiety, trait

depression and ethnicity were entered as control variables (Raes, 2010). The 95%

confidence interval (CI) for rumination was -0.18 and -0.06. As zero was not

included in the interval for rumination, it can be concluded to have partially

mediated the modest relationship between trait anger and resilience. However, the

interval for worry was -0.10 and 0.13. This suggested that worry did not mediate

the relationship between trait anger and resilience as zero was included in its

interval.

In the second analysis (mediation analysis 2 in Table 3.8), resilience was the

dependent variable, trait anxiety was the independent variable and rumination and

worry were entered as the potential mediators. Trait anger, trait depression and

ethnicity were entered as control variables (Raes, 2010). The 95% CIs for

rumination and worry were -0.52 and -0.18 and -0.42 and -0.12 respectively. The

results showed that both rumination and worry partially mediated the significant

relationship between trait anxiety and resilience as neither interval included zero.

In the third analysis (mediation analysis 3 in Table 3.8), resilience was the

dependent variable, trait depression was the independent variable and rumination

and worry were the potential mediators. Trait anger, trait anxiety and ethnicity

were entered as control variables (Raes, 2010). The 95% CIs for rumination and

worry were -0.51 and -0.11 and   -0.41 and -0.02 respectively. It can be

concluded that both rumination and worry partially mediated the significant

relationship between trait depression and resilience as zero was not included in

either interval.
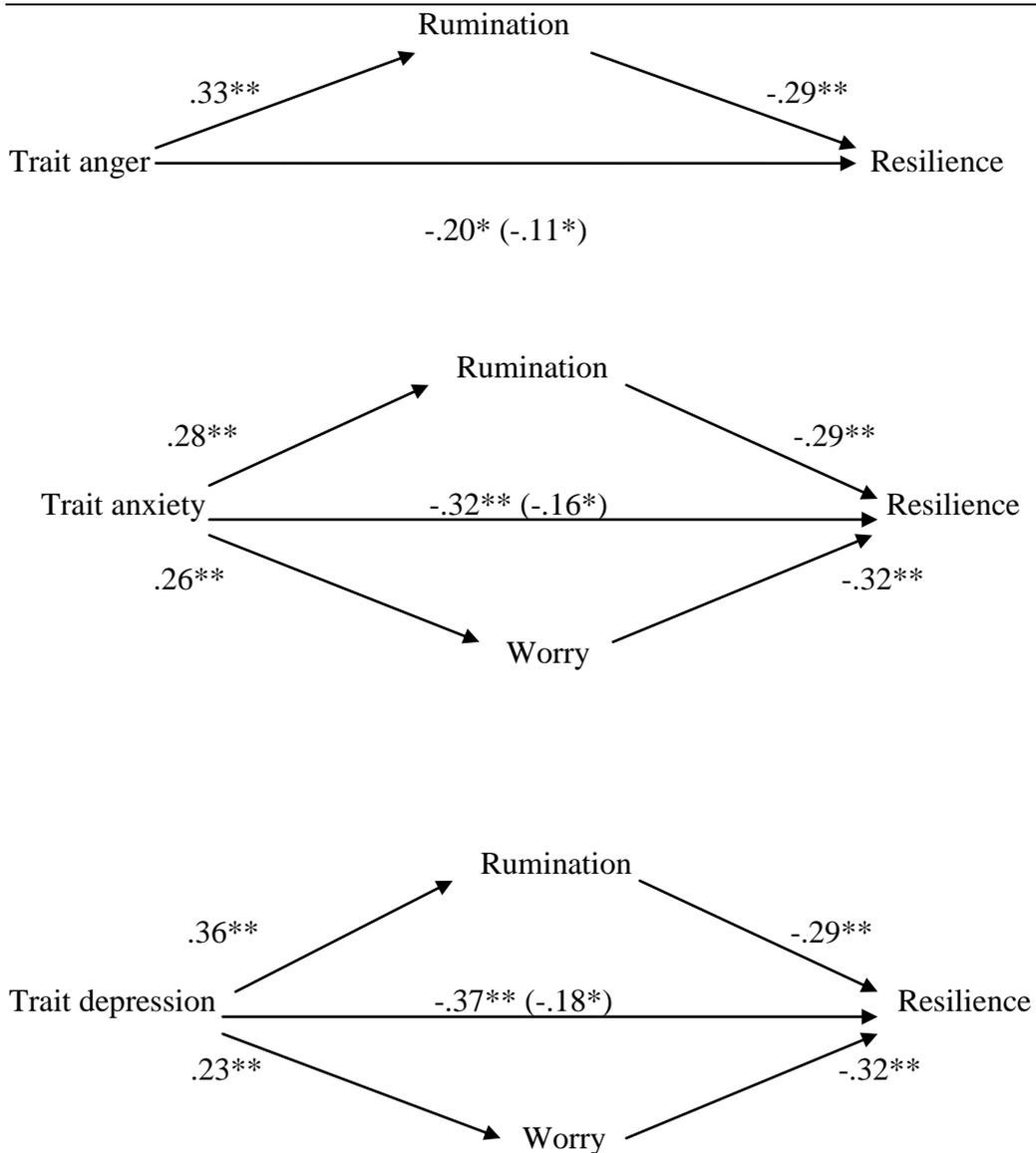
Figure 3.9. Results of the mediation analyses.

3.3.3. Discussion and Conclusions

Higher scores on all negative trait emotions were significantly negatively

correlated with resilience. Again, this corroborates prior findings concerning the

relationship between negative trait emotion and resilience (Fox & Spector, 1999;

Manasse & Ganem, 2009; Moosbrugger & Schermelleh-Engel, 1991) and

109

highlights the increased likelihood of students high on negative trait emotion to

experience difficulties adjusting to university life.

Rumination and worry were significantly highly correlated (p <.001),

suggesting that they may assess the same thinking construct (negative thinking

styles) as has been shown in previous analyses within the literature (Siegle et al.,

2004). In further support of this and in line with the hypothesis, rumination and

worry were both significantly negatively correlated with resilience and

significantly positively correlated with trait anger, trait anxiety and trait

depression.

However, all the hypothesised mediating relationships were not confirmed.

On the one hand, as anticipated, rumination significantly mediated the

relationship between all three negative trait emotions and resilience. On the other

hand, worry mediated the relationship between both trait anxiety and resilience

and trait depression and resilience but not between trait anger and resilience.

These results refuted the trait-congruent hypothesis: they failed to associate

anxiety-congruent thinking patterns (worry) exclusively to trait anxiety.

Furthermore, they support previous research which has also found depressive and

anxious thoughts to be very highly correlated, suggesting the presence of inherent

similarities between the two (Hong, 2007; Muris, Roelofs, Rassin, Franken &

Mayer, 2005; Starcevic, 1993). These findings thus provide preliminary evidence

contradicting the proposed impact of trait-congruent thinking styles on the levels

of resilience of students high on trait anger, trait anxiety or trait depression.

3.4   General Discussion and Conclusions

The findings thus far suggest that the framework proposed in Chapter 1 can be applied to exploring adjustment among students high on negative trait emotion. They showed that university students high on negative trait emotion possessed the lower levels of resilience that have been linked to poor adjustment in other populations. This supports an analysis of resilience among students high on negative trait emotion in order to understand the cognitive processes influencing student adjustment to university life.

The results showed that rumination mediated the relationship between all three negative trait emotions and resilience. These findings provide support for prior research on the association between negative thinking and resilience (Alloy et al., 2006; Borkovec et al., 1998; Calmes & Roberts, 2007; Harrington & Blankenship, 2002; Lyubomirsky & Nolen-Hoeksema, 1995; Nolen-Hoeksema, 2000; Ray et al., 2005) and negative trait emotion and negative thinking (Berry et al., 2005; Eyesenck & Van Berkum, 1992) and suggest that these relationships may be important to understanding student adjustment to university life. For instance, they hint that, as argued by Fredrickson (2001), negative thinking may be a form of "narrowed, pessimistic thinking" (p. 9) which hinders the development of higher levels of resilience by creating a "downward spiral" which eventually leads to poor functioning.

However, in Study 1, despite the use of more efficient video stimuli, negative cognitive appraisals did not impact resilience. In addition, Study 2 showed that angry cognitive appraisals did not influence the impact of rumination on resilience. These findings opposed aspects of Fredrickson's argument.

Fredrickson claimed that negative emotions generated negative thinking and as such were influential within the downward spiral. For instance, she traces depression to "a downward spiral in which depressed mood and the narrowed, pessimistic thinking it engenders influence one another reciprocally, over time leading to ever-worsening moods and even clinical levels of depression" (p. 9). The current findings instead align with the arguments of Tedeschi and colleagues (2000, 2006, 2008) who differentiated between automatic cognitive processes which occur in the immediate aftermath of the event (and trigger negative emotions) and more longer term thinking patterns which exist outside of the influence of these automatic cognitive processes. In line with this, the results suggest that among students high on negative trait emotion, negative thinking styles, and not negative emotions, may be the main cause of their difficulties in developing higher levels of resilience.

The findings also suggested that further research was warranted. Specifically, researchers claim that positive cognitive appraisals influence resilience autonomously from their negative equivalents and thus need to be explored independently (Watson, Clark & Tellegen, 1988). In particular, research has found that positive emotions can undo the impact of negative emotions (Fredrickson, 2001; Fredrickson, Mancuso, Branigan & Tugade, 2000). Therefore, the absence of a significant impact of negative cognitive appraisals and their associated emotions may have been due to how students high on negative trait emotion experience positive emotions. The next chapter will thus explore the impact of positive cognitive appraisals and positive thinking on the relationship between negative trait emotion and resilience.

In addition, Studies 2 and 3 suggested the need for further investigations

exploring whether the impact of trait anger, trait anxiety and trait depression on

students' levels of resilience should be analysed separately. Researchers have

linked negative trait emotion to trait-congruent cognitive processes (Honk et al.,

2001; MacLeaod & Rutherford, 1991; Parrot et al., 2005; Rosenberg, 1998). As

such, it was anticipated that the levels of resilience associated with each of these

traits would be related to distinct trait-congruent thinking patterns. This

relationship emerged in explorations of cognitive appraisals in Study 1 however

in Study 3, negative trait emotion was not significantly related to trait-congruent

thinking styles. As evidence supporting the trait-congruent hypothesis had

previously been derived mainly from studies into automatic cognitive processes

(Honk et al., 2001; MacLeod & Rutherford, 1991; Parrot et al., 2005), it can be

argued that the findings do not oppose but rather extend previous results: they

suggest that the trait-congruent hypothesis may not be applicable to longer-term

processes and thus negative trait emotion may not influence resilience through

distinct trait-congruent cognitive pathways.

This is emphasised by several additional aspects of the findings. Primarily,

the similarities that emerged between trait anxiety and trait depression but not

trait anger in all three studies. Secondly, in Study 2, rumination did not fully

account for the lower levels of resilience associated with trait anxiety and trait

depression, but rumination fully explained the relationship between trait anger

and resilience. Thirdly, for all studies, the relationships between trait anxiety and

resilience and trait depression and resilience were very significant (all ps $<.01$)

while trait anger was only modestly related to resilience ($p <.05$). This

specifically suggests that, unlike trait anxiety and trait depression, trait anger may

not exert a significant influence on students' levels of resilience. Collectively,

these results call into question whether the three negative emotions should be

explored individually within the remaining studies. As such, the following chapter

will also comment on any similarities that emerge in how trait anxiety and trait

depression are related to positive cognitive appraisals and positive thinking styles.

Chapter 4 An evaluation of the influence of positive cognitive appraisals and positive thinking styles

This chapter evaluates the influence of positive cognitive appraisals and positive thinking styles on the levels of resilience of students high on negative trait emotion. Its its findings will be used to adjust the model so that it is better suited to the intended evaluation of student adaptation to university life. The cognitive process – either positive cognitive appraisals or positive thinking styles – that emerges as more influential will subsequently be one of the main focuses within the remaining analyses.

This evaluation is presented in a series of three studies. Study 1 compares the impact of positive cognitive appraisals and positive thinking styles on the relationship between negative trait emotion and resilience. Study 2 analyses the relationship between positive cognitive appraisals and positive thinking styles and whether this interaction influences students' levels of resilience. Study 3 explores the trait-congruent hypothesis by evaluating the influence of future- versus past-oriented positive thinking styles.

4.1   Study 4: Negative trait emotion, positive cognitive appraisals, positive thinking and resilience

This empirical study compares the influence of positive cognitive appraisals and positive thinking styles on the relationship between negative trait emotion and resilience. It has two aims. Primarily, it is performed because of the independence that exists between negative and positive emotions (Watson et al., 1988). Unlike negative emotions, positive emotions have been linked to improved levels of resilience (Fredrickson & Branigan, 2005; Fredrickson et al., 2003). In addition,

research has found that positive emotions can counteract the impact of negative

emotions on individuals' behaviour (Fredrickson et al., 2000). This means that

positive cognitive appraisals and the positive emotions they elicit may have

caused the non-significant relationships between negative cognitive appraisals

and resilience that emerged in Study 1. As such, this study performs an

independent investigation of the impact of positive emotions. It specifically

explores the impact of positive emotions on the relationship between negative

trait emotion and resilience.

Furthermore, as discussed in Chapter 1, positive thinking may also

influence whether individuals have difficulty developing higher levels of

resilience (Carver, Scheier & Segerstrom, 2010; King & Raspin, 2004; Taylor,

Larsen-Rife, Conger, Widaman & Cutrona, 2010).Theorists describe positive

thinking as the habitual tendency to judge situations favourably, to assign

favourable attributes to objects and to focus on "deriving pleasure through

anticipating upcoming positive events, savouring positive moments, and

reminiscing about past positive experiences" (Bryant, 2003, p. 175). Chapter 1

argued that positive thinking influences resilience by helping individuals to find

meaning in their experiences (Carver et al. 2010; Taylor et al., 2010). Therefore,

negative trait emotion may also impact students' levels of resilience through

reduced positive thinking. As such, in evaluating the mediating impact of thinking

styles, the influence of positive thinking must be examined.

In addition to the hypothesis that all three negative trait emotions would be

negatively related to resilience, it was hypothesised that positive emotions and

positive thinking would be positively correlated with resilience and negatively

correlated with the three negative trait emotions. Based on prior empirical work

emphasizing the important role played by positive emotions and positive thinking

on individuals' levels of resilience (Carver et al., 1993; Fredrickson, 2001;

Fredrickson et al., 2003; Litt et al., 1992; Ong et al., 2006; Schok et al., 2010;

Tugade & Fredrickson, 2004), it is anticipated that positive emotions and positive

thinking will partially mediate the relationship between all three negative trait

emotions and resilience.

4.1.1. Method

4.1.1.1.   Participants

This study used the same participants as Study 3.

4.1.1.2.   Materials and apparatus

(1) As in Study 1, the same three negative trait emotion measures were used

to assess trait anger (STAXI-II; Spielberger, 1999), trait anxiety (STAI;

Spielberger et al., 1983) and trait depression (STPI-TD; Spielberger et al., 1995).

(2) Positive cognitive appraisals were assessed by evaluating positive

emotions with the positive affect sub-scale of the Positive and Negative Affect

Schedule (PANAS-PA; Watson et al., 1988; see Appendix A8). This measure has

been used in previous research to examine automatic positive emotions

(Schneider, Gur, Gur & Muenz, 1994). The PANAS-PA is a 10 item scale which

can be changed so as to assess participants' levels of several positive emotions,

for example happiness, over different periods of time such as at the present

moment, over the past week or during the past month. For this study, the measure

was adjusted to enable participants to rate their current levels of positive emotion

(Arch & Craske, 2006; Burns, Kubilus & Bruehl, 2003). Items were assessed on a

five-point scale including 1 (*very slightly or not at all*), 2 (*a little*), 3 (*moderately*),
4 (*quite a bit*) and 5 (*very much*). The PANAS-PA has high alpha coefficients
among university student samples (ranging from 0.86 to 0.90) (Watson et al.,
1988).

(3) The Life Orientation Test–Revised (LOT-R; Scheier, Carver, & Bridges,
1994; see Appendix A9), a measure of optimistic thinking, was used to evaluate
positive thinking styles. This measure is frequently used to assess positive
thinking and its impact on adaptation within a variety of populations (Baldwin,
Jackson III, Okoh & Cannon, 2010; Taylor et al., 2010). It was chosen for two
main reasons: (1) the items had been revised so that they all explicitly focused on
positive expectations (increased content validity) and (2) the scale was brief (an
important consideration given the number of measures participants had to
complete). Thus it was deemed ideal for the intended analysis. The LOT-R
comprised 10 Likhert-type items (1 – *strongly agree* to 5 – *strongly disagree*), 4
of which are filler items. Total scores were derived by summing the three
positively worded and three negatively worded items after the positively-worded
items were reverse scored. This gives a possible score range of 6 to 30, with
higher scores indicating an increased dispositional tendency to engage in
optimistic thinking. Scheier et al. (1994) reported an internal reliability coefficient
of 0.78 for a similar undergraduate sample.

(4) Resilience was assessed using the CD-RISC (Connor & Davidson,
2003) that was used in Study 1.

4.1.1.3.   Procedure

The procedure was detailed in Section 3.3.1.3.

4.1.1.4. Data analysis

As the assumption of normality was violated (see Section 3.3.1.4), similar to Study 3, Spearman's rho was applied to evaluate correlations and bootstrapping (5,000 resamples with the bias and accelerated method) was used for the mediation analyses. The mediation analyses were again performed using the PROCESS programme (Preacher & Hayes, 2004; 2008a) within SPSS (19.0, IBM Statistics). Three mediation analyses were conducted as depicted in Table 4.1. Control variables were used based on previous research (Raes, 2010).

Table 4.1.

The mediation analyses being performed in Study 4

Mediation analysis	Independent variable	Mediator variables	Dependent variable	Control variables
(1)	Trait anger	Positive emotions Positive thinking	Resilience	Trait anxiety Trait depression
(2)	Trait anxiety	Positive emotions Positive thinking	Resilience	Trait anger Trait depression
(3)	Trait depression	Positive emotions Positive thinking	Resilience	Trait anger Trait anxiety

4.1.2. Results

4.1.2.1.   Descriptive statistics

Means, standard deviations and ranges are reported in Table 4.2. Similar to Study 3, the means on the negative trait emotion and resilience measures were generally comparable to prior research in similar undergraduate populations (Bitsika, Sharpley& Peters, 2010; Culhane & Morera, 2010; Litman et al., 2005; Roger & Najarian, 1989; Spielberger, 1999; Spielberger et al., 1983; Speilberger, 1995). For the PANAS-PA, the means were also comparable to prior studies using undergraduates (Andreotti et al., 2013; Zhang, Chung, Si, & Liu, 2014).

4.1.2.1.   Preliminary analyses

Mann-Whitney U tests did not reveal significant gender differences (see Appendix C). However, as discussed in Study 3, Krusall-Wallis tests (see Appendix C) showed that White American students had significantly higher levels of resilience than Asian British students, $H(7)=-3.25$, $p=.032$. Therefore, ethnicity was entered as a control variable in the mediation analyses.

4.1.2.1.   Correlations

Table 4.3 shows the correlations between trait anger, trait anxiety, trait depression, positive emotions, positive thinking and resilience scores. As hypothesised, all the negative trait emotions were significantly negatively correlated with resilience and resilience was significantly positively related to positive emotions and positive thinking. However, contrary to the hypotheses, although trait anxiety and trait depression were significantly negatively related to positive emotions and positive thinking, trait anger was not significantly related to positive emotions and positive thinking.

Table 4.2.

Means, standard deviations and ranges for the predictor, mediator and outcome

variables in Study 4

Variable	M	SD	Range
Trait anger	14.38	4.40	8.00 – 31.00
Trait anxiety	42.37	9.69	22.00 – 72.00
Trait depression	18.79	5.46	10.00 – 36.00
Positive emotions	32.60	7.86	4.00 – 49.00
Positive thinking	20.38	4.79	6.00 – 30.00
Resilience	63.50	11.66	28.00 – 91.00

Based on these correlations, the first mediation analysis (mediation analysis
1 shown in Table 4.1) was not performed. This was done because a significant
relationship between the independent and potential mediator variables is a
prerequisite for performing mediation analyses (Field, 2013; Shrout & Bolger,
2002).

Table 4.3.

Correlations between negative trait emotions, resilience and positive emotions

Variable	1	2	3	4	5	6
(1) Trait anger		0.28***	0.25***	-0.08	-0.12	-0.15*
(2) Trait anxiety			0.82***	-0.58**	-0.67**	-0.66**
(3) Trait depression				-0.62**	-0.60**	-0.52**
(4) Positive emotions					0.43***	0.42***
(5) Positive thinking						0.62***
(6) Resilience						

Notes: ***p <.001, **p < 0.01, *p <.05.

4.1.2.1.   Mediation analyses

Two mediation analyses were performed. The significant mediations are
presented in Figure 4.1 where standardised regression coefficients are reported.

In the first analysis (mediation analysis 2 in Table 4.1), resilience was the
dependent variable, trait anxiety was the independent variable. Positive emotions
and positive thinking were entered as mediators. The control variables were
ethnicity, trait anger and trait depression. The 95% confidence intervals (CIs) for
positive emotions and positive thinking were -0.06 and 0.02 and -0.29 and -0.09
respectively. The results show that positive emotions did not mediate the
relationship between trait anxiety and resilience as its interval included zero.
However, positive thinking partially mediated the relationship between trait
anxiety and resilience as its interval did not include zero (Field, 2013). The model
explained 31.82% of the variance in resilience scores.

In the second analysis (mediation analysis 3 in Table 4.1), resilience was the
dependent variable, trait depression was the independent variable. Positive
emotions and positive thinking were entered as mediators. The control variables
were ethnicity, trait anxiety and trait anger. The 95% CIs for positive emotions
and positive thinking were -0.21 and 0.10 and -0.27 and -0.01 respectively. It can
be concluded that positive emotions did not mediate the relationship between trait
depression and resilience as zero was included in its interval (Field, 2013).
However, positive thinking partially mediated the relationship between trait
depression and resilience as its interval did not include zero (Field, 2013). The
model explained 31.82% of the variance in resilience scores.

Positive thinking

-0.67***   -0.53***

Trait anxiety ──────────────────────────────→ Resilience

-0.27** (-0.17*)

Positive thinking

0.61***   -0.53***

Trait depression ──────────────────────────────→ Resilience

-0.21** (-0.18*)
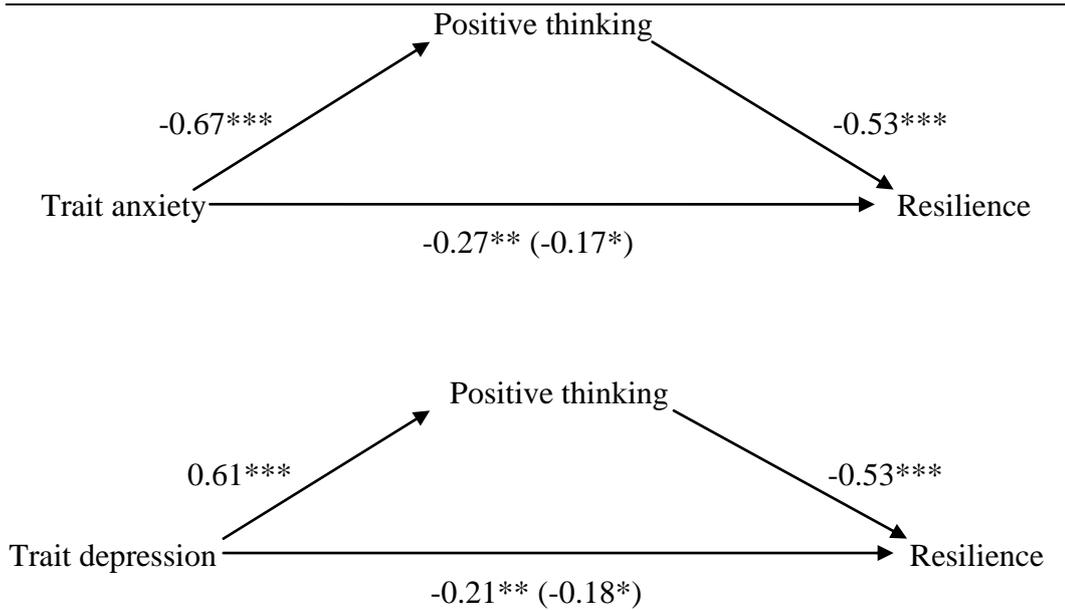
Figure 4.1. Results of the mediation analyses.

4.1.3. Discussion and Conclusions

Not all the hypotheses related to positive thinking were supported. Positive thinking was significantly negatively related to trait anxiety and trait depression but not to trait anger. In addition, the mediation analyses revealed that positive thinking partially mediated the relationship between trait anxiety/trait depression and resilience but not the relationship between trait anger and resilience. The significant results obtained for trait anxiety and trait depression support the hypotheses. They also substantiate existing arguments about the role played by positive thinking on resilience (Fredrickson & Branigan, 2005; Fredrickson et al., 2003; Ong et al., 2006; Tugade & Fredrickson, 2004) and suggest that positive thinking may be influential in student adjustment to university life.

For instance, they suggest that, as argued by Fredrickson, positive thinking plays a significant role in building resilience through an "upward spiral" (p. 9).

Fredrickson attributed the spiral to positive thinking that she described as
"broadened thinking" which incorporates flexible, and creative optimistic
thinking. She specifically described this "upward spiral" as core to increased
levels of resilience and well-being. The findings align with her postulations: here
it was found that reduced positive thinking partially explained the lower levels of
resilience associated with high trait anxiety and high trait depression. This
suggests that positive thinking promotes students' resilience and may therefore be
important in enabling students to adjust to university life.

Conversely, the hypotheses that were not supported (those obtained for trait
anger) suggest that positive thinking may differ in its influence on student
adjustment to university life based on the specific negative trait emotion. These
findings hint that positive thinking may not be significantly related to the lower
levels of resilience associated with trait anger. They support the findings of Study
2 where rumination was found to fully mediate the relationship between trait
anger and resilience. However, as was found in Chapter 3, the current findings
show that trait anger may not influence resilience through the same cognitive
processes as trait anxiety and trait depression. This bolsters the arguments
concerning the trait-congruent hypothesis put forth in Chapter 3: that negative
trait emotion may not impact resilience through three distinct cognitive pathways.

Lastly, in support of the hypotheses, positive cognitive appraisals (assessed
with a measure of positive emotions) was positively correlated with resilience and
significantly negatively correlated with trait anxiety and trait depression. In
addition, although a significant correlation did not emerge between trait anger and
positive emotions, evidence showed that a negative relationship existed.

125

Therefore, the findings support the proposed beneficial influence of positive

emotions on resilience (Fredrickson & Branigan, 2005; Fredrickson et al., 2003;

King et al., 2006; Ong et al., 2006; Tugade & Fredrickson, 2004).

However, within the current study, the mediation analyses revealed that

positive emotions did not exert a significant mediating impact for any of the

negative trait emotions. This contradicts the hypotheses and the arguments of

Fredrickson (2001) who claimed that positive emotions play a primordial role in

promoting higher levels of resilience. These results instead suggest that among

students high on negative emotion, the tendency to experience significantly less

positive emotions may not influence their development of higher levels of

resilience, and by extension, may not impact whether or not they adjust to

university life; but additional research is warranted. The findings revealed that

positive cognitive appraisals were significantly related to the positive thinking

measure. This suggests that positive cognitive appraisals may influence the

relationship between negative trait emotion and resilience through positive

thinking styles. As such, the next study will explore the relationship between

positive cognitive appraisals and positive thinking to determine whether these

processes interact to influence the association between trait anxiety/trait

depression and resilience.

4.2   Study 5: Evaluating the impact of positive emotions and positive

   thinking on the relationship between negative trait emotion and

   resilience

This study further analyses the partial mediation of positive thinking on the

relationship between trait anxiety and resilience as well as between trait

depression and resilience that emerged in Study 4 using the same sample of

university students. These findings suggested that positive cognitive appraisals

may influence students' levels of resilience indirectly through positive thinking

styles. The previous study compared the impact of positive emotions and positive

thinking on students' resilience but did not explore how these two may interact.

Therefore, this study was performed to evaluate whether the following three-path

mediating effect exists: negative trait emotion → positive cognitive appraisals →

positive thinking → resilience.

Research has supported this relationship. Fredrickson (2001) argues that

positive emotions and positive thinking interact to exert their influence on

adjustment. She specifically claims that positive emotions generate positive

thinking and it is this reciprocal relationship between these two processes that

promote higher levels of resilience. Within the prior study, positive emotion

scores were significantly related to the positive thinking measure, lending support

to Fredrickson's arguments. However, additional research suggests that positive

emotions may not exert any influence among individuals with high levels of

negative trait emotion (Larsen & Ketelaar, 1991; Rusting & Larsen, 1998).

These researchers explored the relationship between individuals' levels of

neuroticism and their experience of positive emotions using experiments

incorporating mood induction (thus enabling some insight into cause-and-effect).

Neuroticism is a personality trait closely related to negative trait emotion.

According to researchers, both neuroticism and negative trait emotion emphasize

individual differences in negative emotional reactivity but in distinct ways

(Rusting & Larsen, 1998). Their findings showed that neuroticism did not

influence individuals' experience of positive emotion (Larsen & Ketelaar, 1991;
Rusting & Larsen, 1998). Both experiments were performed in undergraduate
populations (359 and 150 undergraduate students respectively) and incorporated
the same imagery task which successfully induced positive and negative emotions
among their participants. Confidence can thus be placed in their findings and the
absence of a relationship between neuroticism and positive emotions among the
undergraduate student population, suggesting that positive emotions may not
influence the levels of resilience associated with negative trait emotion.

The present study also further analyses the partial mediating influence of
positive thinking that emerged in Study 4. As discussed in Study 2, researchers
recommend that the PROCESS programme that was used for the mediation
analyses in Study 4 be implemented as a preliminary analysis. They assert that its
results should be confirmed using further tests (NICHD Early Childcare Research
Network, 2002). Therefore, in order to determine whether a full mediation
existed, the significant partial mediations for trait anxiety and trait depression
were assessed using path analysis. Path analysis was chosen because of the
complexity involved in assessing the three path mediating effect between trait
anxiety/depression, positive cognitive appraisals, positive thinking and resilience
(Iacobucci, 2008; King, King, Foy, Keane & Fairbank, 1999). In line with the
findings of Study 2, significant partial mediations are hypothesised as follows:
trait anxiety/trait depression → positive thinking → resilience.

4.2.1. Method

This study utilised the participants and measures from Study 4 within its
path analysis. The path analysis was run using AMOS (version 19; IBM software)

with the maximum likelihood estimation technique (ML; Arbuckle, 2010). In

addition to the chi-square statistic (χ^2), the same four approximate fit indices

(AFIs) were used as was done in Study 2. These AFIs included: (1) Comparative

Fit Index (CFI), (2) Tucker-Lewis Index (TLI), (3) Root Mean Square Error of

Approximation (RMSEA) and (4) Akaike Information Criterion (AIC). A good-

fitting model was indicated by non-significant results on the χ^2 test. In addition, a

cut-off of 0.95 was used for the CFI and the TLI, as for these AFIs values close to

1.00 indicated the best fit (Hu & Bentler, 1999; Kline, 2011). For the RMSEA,

values ≤ 0.05 indicated close approximate fit, values between 0.05 and 0.08

suggested reasonable fit, and values ≥ 0.10 suggested poor fit. Therefore, a cut-off

of 0.05 was used. As in Study 2, the AIC values for all models were compared,

and the model with the lowest AIC was labelled the best fit to the data.

In addition, the fit of the hypothesised models – that positive thinking

partially mediated the relationship between trait anxiety and resilience and

between trait depression and resilience (Figure 4.2) – was compared to the fit of

two alternative theoretically derived nested models (Figures 4.3 and 4.4). The first

competing model hypothesised that positive thinking fully mediated the

relationship between trait anxiety/trait depression and resilience (see Figure 4.3).

The second competing model hypothesised that positive cognitive appraisals

triggered positive thinking and this interaction mediated the relationship between

trait anxiety and resilience and between trait depression and resilience (see Figure

4.4).

The fit of the models was compared using sequential χ^2 difference tests as

was done in Study 2 (Anderson & Gerbing, 1988; Byrne, 2010; Houghton &

Jinkerson, 2007). Sequential χ^2 difference tests compare the fit of the hypothesised model to each competing model and determine whether they significantly differ on the χ^2 statistic and the four AFIs previously described (Anderson & Gerbing, 1988; Houghton & Jinkerson, 2007). According to Houghton and Jinkerson (2007), if the fit indices significantly differ, the better fitting model is retained. However, if the fit indices are not significantly different (their values remain unchanged or only slightly worsen), this means that there is little difference between the two models being compared and thus the more parsimonious of the two should be retained.
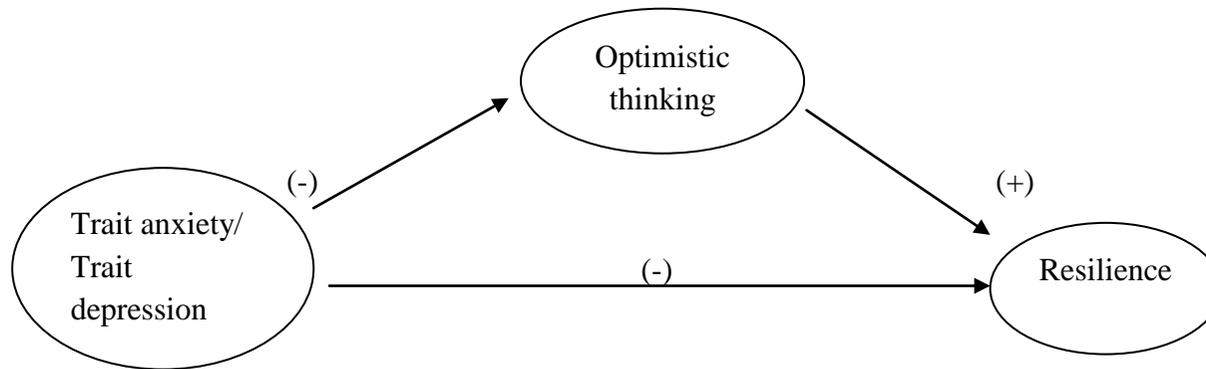
Figure 4.2. The hypothesised partial mediation model proposed for trait anxiety and trait depression
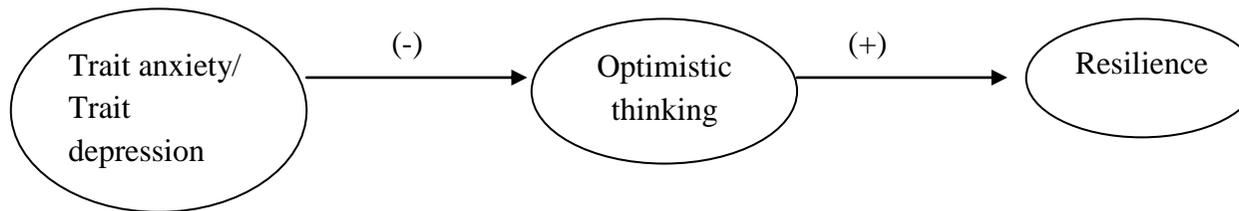
Figure 4.3. The full mediation model proposed for trait anxiety and trait depression
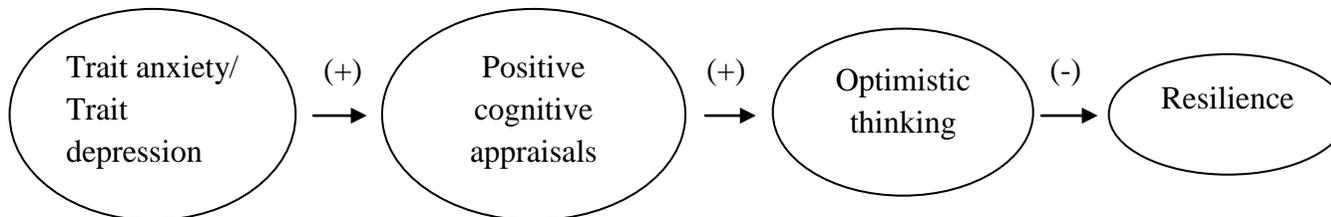
Figure 4.4. The three path mediating model proposed for trait anxiety and trait depression.

4.2.2. Results

4.2.2.1.   Descriptive statistics

Means, standard deviations and ranges are reported in Table 4.2.

4.2.2.2.   Preliminary analyses

Data were assessed against the assumptions for path analysis (Kline, 2011):

(1)   Temporal precedence exists, that is, the cause (X) precedes the effect (Y).

Within this study there was no temporal precedence. However, Kline states that

when temporal precedence is absent, valid results can be assured when there is "a

clear, substantial rationale...for specifying that X is a cause of Y" (Kline, 2011, p.

113). Evidence in support of this can be found in Sections 1.4.1.2 and 1.5 which

presented studies linking positive emotions and positive thinking to resilience and

linking negative emotion to resilience respectively. Evidence supporting a

relationship between negative trait emotion, positive emotions and positive

thinking can be derived from studies into similar negative traits such as

neuroticism (Harris & Lightsley Jr., 2005; Shiota, Keltner & John, 2006). Lastly,

evidence in support of the relationship between positive cognitive appraisals and

optimistic thinking emerges from the postulations of Fredrickson (2001) as

detailed in the review of this current study.

(2)   There is covariation between X and Y. Evidence of this relationship was

shown in Table 4.3. Here trait anxiety and trait depression were both significantly

negatively related to positive thinking, positive emotions and resilience and

positive emotions were positively related to positive thinking and resilience.

(3)   There are no other plausible explanations of the covariation that exists

between X and Y. Evidence in support of this was detailed in Section 1.3 where

the impact of cognition and alternative factors on resilience was compared and

Section 1.5 where the influence of cognitive processes on the relationship

between negative trait emotion and resilience was discussed.

(4)   The distribution meets the assumption of the test being used. Path analysis

requires a normal distribution. As discussed in Study 4, however, within the

current data set this assumption had been violated. Therefore, bootstrapping was

performed using the maximum likelihood estimation method with 2,000

resamples (Byrne, 2010; Kline, 2011; Utsey et al., 2007).

(5)   The direction of the causal relationship is correctly specified. Evidence in

support of this was provided in two sections. Section 1.2 detailed the relationship

between negative trait emotion and resilience while Section 1.4.1 discussed the

relationship between positive emotions, positive thinking styles and resilience. In

addition, evidence supporting the direction of the causal relationships between

negative trait emotion, positive cognitive appraisals and positive thinking can be

derived from previous research into neuroticism (Harris & Lightsley Jr., 2005;

Shiota et al., 2006).

4.2.2.3.   Path analyses

4.2.2.3.1.   Trait anxiety

Fit indices for the three models for trait anxiety are presented in Table 4.4.

The results suggested that the hypothesised model (see Figure 4.2) presented the

best fit to the data, χ^2 [2, N=235] = 1.28, p =.528, TLI=1.01, CFI=1.00,

RMSEA=0.00, AIC=17.28. This was further supported by the χ^2 difference tests

where this model emerged as providing a significantly better fit to the data than

the other two models (all *ps* <.001).

The results suggested that positive thinking partially mediated the

relationship between trait anxiety and resilience. The standardised solution for the

model is shown in Figure 4.5, with measurement error effects omitted for clarity

(Houghton & Jinkerson, 2007).
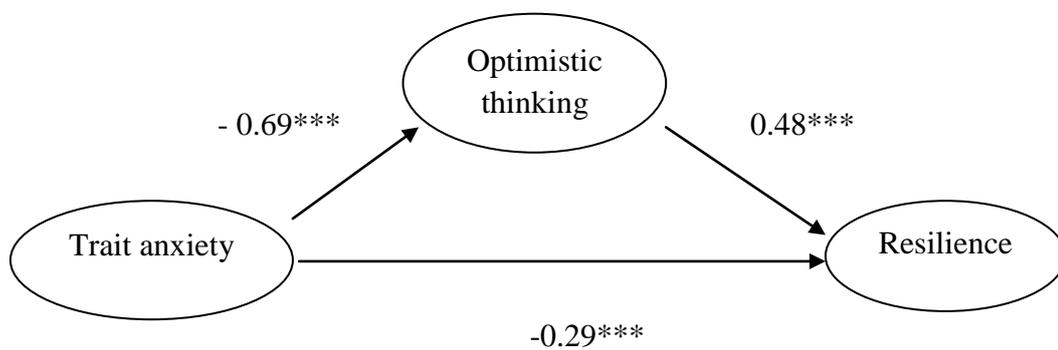
Figure 4.5. The best fitting model regarding the mediating effects of positive

cognitive appraisals and positive thinking on the relationship between trait

anxiety and resilience.

4.2.2.3.2.   *Trait depression*

Fit indices for the three models for trait depression are presented in Table

4.5. The results suggested that the hypothesised model (see Figure 4.2) presented

the best fit to the data, χ^2 [2, N=235] = 2.56, *p* =.278, TLI=1.00, CFI=1.00,

RMSEA=0.04, AIC=18.56. This is further supported by the χ^2 difference tests

where this model emerged as providing a significantly better fit to the data than

the other two models (all *ps* <.001).

The results suggested that positive thinking partially mediated the

relationship between trait depression and resilience. The standardised solution for

the model is shown in Figure 4.6, with measurement error effects omitted for

clarity (Houghton & Jinkerson, 2007).
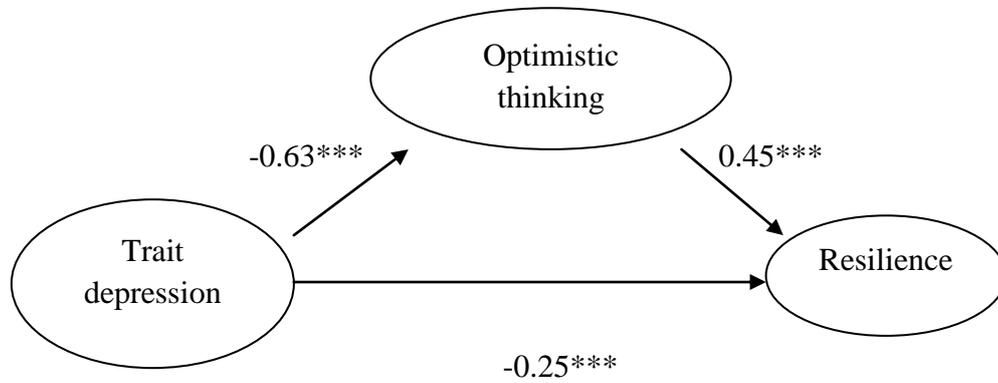
Figure 4.6. The best fitting model regarding the mediating effects of positive

cognitive appraisals and positive thinking on the relationship between trait

depression and resilience

Table 4.4

Summary of the goodness of fit indices for the hypothesised and competing models for trait anxiety

Models	χ^2 (df)	TLI	CFI	RMSEA (90% CIs)	AIC	χ^2 difference (df)
				Goodness of fit statistics		
Optimal value	Non-significant	≥0.95	≥0.95	≤0.05	Lowest value	
Model 1	1.28 (2)	1.01	1.00	0.00 (0.00 - 0.11)	17.28	
Model 2	52.12***(3)	0.75	0.87	0.27 (0.20 - 0.33)	66.12	50.84***(1)
Model 3	51.13***(3)	0. 62	0.87	0.32 (0.25- 0.40)	67.13	49.85 ***(1)

Table 4.5

Summary of the goodness of fit indices for the hypothesised and competing models for trait depression

Models	χ^2 (df)	Goodness of fit statistics				χ^2 difference
		TLI	CFI	RMSEA (90% CIs)	AIC	(df)
Optimal value	Non-significant	≥0.95	≥0.95	≤0.05	Lowest value	
Model 1	2.56 (2)	1.00	1.00	0.04 (0.00 - 0.14)	18.56	
Model 2	18.27*** (3)	0.91	0.96	0.15 (0.09 - 0.22)	32.27	15.71*** (1)
Model 3	17.62***(3)	0.86	0.96	0.18 (0.11- 0.27)	33.62	15.06*** (1)

4.2.3. Discussion and Conclusions

This study was performed to assess the impact of the relationship between positive cognitive appraisals and positive thinking and to further evaluate the mediations that emerged in Study 4. The findings revealed that optimistic thinking partially mediated the relationship between trait anxiety/trait depression and resilience. These results confirmed the hypotheses.

For trait anxiety and trait depression the absence of a significant influence of positive cognitive appraisals on the relationship between negative trait emotion and resilience supported the hypotheses. In addition, these results also aligned with prior research involving neuroticism (Larsen & Ketelaar, 1991; Rusting & Larsen, 1998). They therfore extend existing findings by showing that, similar to neuroticism, positive emotions may not exert any influence on the levels of resilience of individuals with high levels of negative trait emotion. They also suggest that the difficulties adjusting to university life that students high on negative trait emotion may encounter may not be associated with their reduced experience of positive emotions.

The hypotheses predicting a significant partial mediation of positive thinking on the relationship between trait anxiety and resilience as well as trait depression and resilience were confirmed. This supported the hypotheses as well as the postulations made in Chapter 1 where it was asserted that positive thinking styles influenced, but did not fully explain, the relationship between negative trait emotion and resilience. Lastly, the similar results that emerged for trait anxiety and trait depression again bolster the arguments put forth in Chapter 3: that negative trait emotion may not influence students' levels of resilience through

distinct cognitive pathways. The next study will further explore this by incorporating an additional measure of positive thinking styles which incorporates scales evaluating past-, present- and future-oriented positive thinking.

4.3   Study 6: An examination of the trait-congruent hypothesis in relation to positive thinking styles

This study is performed based on the previous findings of Study 5. Here, it was found that longer term cognitive processes (assessed with a measure of optimistic thinking) influenced the relationship between trait anxiety/depression and resilience. This validated the influence of longer term thinking that was found in Chapter 2. However, no study has yet evaluated the relationship between negative trait emotion and trait-congruent positive thinking. Therefore, the current analysis evaluates whether trait anger, trait anxiety and trait depression are related to trait-congruent patterns of positive thinking styles.

Negative correlations were anticipated between: (1) all three negative trait emotions and resilience, (2) all three negative trait emotions and the three sub-scales of the additional measure and (3) trait anxiety/trait depression and optimistic thinking. Positive correlations were anticipated between all measures of positive thinking and resilience. In line with the trait-congruent hypothesis, significant partial mediations were hypothesised as follows: (1) trait anxiety/trait depression → optimistic thinking → resilience, (2) trait anger/depression → past-oriented positive thinking → resilience and (3) trait anxiety → future-oriented positive thinking→ resilience (Papageorgiou & Wells, 1999; Stöber, 2000).

4.3.1. Method

4.3.1.1.   Participants

This study utilised the participants from Study 3.

4.3.1.2.   Materials and apparatus

(1) As in Study 1, the same three negative trait emotion measures were used
to assess trait anger (STAXI-II; Spielberger, 1999), trait anxiety (STAI;
Spielberger et al., 1983) and trait depression (STPI-TD; Spielberger et al., 1995).

(2) The Life Orientation Test–Revised (LOT-R; Scheier, Carver, & Bridges,
1994) was used to evaluate positive thinking styles.

(3) The Savouring Beliefs Inventory (SBI; Bryant, 2003; see Appendix
A10) was also implemented to evaluate positive thinking styles. This measure has
been used as an assessment of positive thinking in previous research (Johnson,
Eisner & Carver, 2009; Wood, Heimpel & Michela, 2003). It assessed
individuals' tendency to enjoy pleasant experiences in the moment (savouring the
present), pleasurably anticipate them beforehand (savouring the future), and
pleasurably recall them afterward (savouring the past) using 24 items organised
into three subscales. The savouring the past subscale included 8 items such as "I
enjoy looking back on happy times". The savouring the future subscale included 8
items such as "Before a good thing happens, I look forward to it in ways that give
me pleasure in the present". The savouring the present subscale comprised 8 items
such as "I know how to make the most of a good time". Four of the items in each
scale were reverse-scored. All items were rated on a 7-point scale ranging from 1
(*strongly disagree*) to 7 (*strongly agree*). Total scores for each subscale were

derived by summing the responses of the 4 positively-anchored items and subtracting responses from the 4 negatively-anchored items, leading to possible scores ranging from -24 to 24. All three sub-scales have reported high reliability in samples of undergraduates with alphas ranging from 0.68 – 0.90 (Bryant, 2003) as well as in the current study (all αs > 0.88).

(4) Resilience was assessed using the CD-RISC (Connor & Davidson, 2003) that was used in Study 1.

4.3.1.3.   Procedure

The procedure is detailed in Section 3.3.1.3.

4.3.1.4.   Data analysis

As discussed in Study 3, the assumption of normality was violated for several of the measures (see Section 3.3.1.4.). The SBI sub-scales were also significantly negatively skewed. Again, the removal of outliers, logarithmic and inverse logarithmic transformations did not improve the distributions. Therefore, Spearman's rho was applied to evaluate correlations and bootstrapping was applied to the mediation analyses (5,000 resamples with the bias and accelerated method). The mediation analyses were again performed using the PROCESS programme (Preacher & Hayes, 2004; 2008a) within SPSS (19.0, IBM Statistics). Three mediation analyses were performed as depicted in Table 4.6. Control variables were used based on previous research (Raes, 2010).

Table 4.6.

The mediation analyses being performed in Study 6

Mediation analysis	Independent variable	Mediator variables	Dependent variable	Control variables
(1)	Trait anger	SBI sub-scales	Resilience	Trait anxiety Trait depression
(2)	Trait anxiety	Optimistic thinking SBI sub-scales	Resilience	Trait anger Trait depression
(3)	Trait depression	Optimistic thinking SBI sub-scales	Resilience	Trait anger Trait anxiety

4.3.2. Results

4.3.2.1. *Descriptive statistics*

Means, standard deviations and ranges are reported in Table 4.2. In Table 4.7, the means, standard deviations and ranges for the three SBI sub-scales are reported. For these subscales, the means were also comparable to prior studies using undergraduates (Bryant, 2003).

4.3.2.1. *Preliminary analyses*

Mann-Whitney U tests did not reveal significant gender differences (see

Table 4.7.

Means, standard deviations and ranges for the three SBI subscales

Variable	M	SD	Range
Savouring the past	12.31	8.83	-24.00 – 24.00
Savouring the present	10.20	9.08	-18.00 – 24.00
Savouring the future	11.59	8.98	-24.00 – 24.00

Appendix C). However, as discussed in Study 2, Kruskall-Wallis tests (see

Appendix C) showed that White American students had significantly higher

levels of resilience than Asian British students, $H(7)=-3.25$, $p=.032$. In addition,

White American students and White British students had significantly higher

scores on the savouring the future and savouring the past subscales than Asian

British students (all ps $<.05$). Therefore, ethnicity was entered as a control

variable in the mediation analyses.

4.3.2.2.   Correlations

Table 4.8 shows the correlations between trait anger, trait anxiety, trait

depression, optimistic thinking, the three SBI sub-scales and resilience scores. As

hypothesised, all the negative trait emotions were significantly negatively related

to resilience and to the three SBI sub-scales while trait anxiety and trait

depression were also significantly negatively related to the optimistic thinking

measure. In addition, all the positive thinking measures were significantly

positively related to resilience.

Table 4.8.

Correlations between negative trait emotions, optimistic thinking, the three SBI sub-scales and resilience

Variable	1	2	3	4	5	6	7	8
(1) Trait anger		0.28***	0.25***	-0.12	-0.21**	-0.27***	-0.16*	-0.15*
(2) Trait anxiety			0.82***	-0.67**	-0.55***	-0.67***	-0.45***	-0.66**
(3) Trait depression				-0.60**	-0.53***	-0.61***	-0.45***	-0.52**
(4) Optimistic thinking					0.42***	0.52***	0.37***	0.62***
(5) Savouring the past						0.81***	0.78***	0.44***
(6) Savouring the present							0.75***	0.54***
(7) Savouring the future								0.31***
(8) Resilience								

Notes: ****$p <.001$, **$p < 0.01$, * $p <.05$

Based on the correlations, as depicted in Table 4.6, the first mediation

analysis was performed with one potential mediator –the SBI sub-scales. This was

done because a significant relationship between the independent and mediator

variables is a prerequisite for performing mediation analyses (Field, 2013; Shrout

& Bolger, 2002) and there was no significant correlation between trait anger and

optimistic thinking.

4.3.2.1.   Mediation analyses

Three mediation analyses were performed. The significant mediations are

presented in Figure 4.7 where standardised regression coefficients are reported.

In the first mediation analysis (mediation analysis 1 in Table 4.6), resilience

was entered as the dependent variable, trait anger was the independent variable

and the three SBI sub-scales were the potential mediators. Trait anxiety, trait

depression, optimistic thinking and ethnicity were entered as control variables

(Raes, 2010). The 95% confidence intervals (CIs) for savouring the past,

savouring the present and savouring the future were -0.05 and 0.07, -0.12 and

0.02 and -0.12 and 0.03 respectively. As zero was included in all three intervals, it

can be concluded that the tendency to savour the past, savour the present and

savour the future did not mediate the modest relationship between trait anger and

resilience.

In the second analysis (mediation analysis 2 in Table 4.6), resilience was the

dependent variable and trait anxiety was the independent variable. Optimistic

thinking and the three SBI sub-scales were entered as potential mediators. Trait

anger, trait depression and ethnicity were also entered as control variables (Raes,

2010). The 95% CIs for optimistic thinking were -0.28 and -0.08. The results

show that optimistic thinking partially mediated the significant relationship

between trait anxiety and resilience as the interval did not include zero. The 95%

CIs for savouring the past, savouring the present and savouring the future were -

0.06 and 0.07, -0.16 and 0.07 and -0.09 and 0.04 respectively. As zero was

included in all three intervals, it can be concluded that the tendency to savour the

past, savour the present and savour the future did not mediate the significant

relationship between trait anxiety and resilience.

In the third analysis (mediation analysis 3 in Table 4.6), resilience was the

dependent variable and trait depression was the independent variable. Optimistic

thinking and the three SBI sub-scales were the potential mediators. Trait anger,

trait anxiety and ethnicity were also entered as control variables (Raes, 2010). The

95% CIs for optimistic thinking were -0.26 and -0.02. It can be concluded that

optimistic thinking partially mediated the significant relationship between trait

depression and resilience as zero was not included in the interval. The 95% CIs

for savouring the past, savouring the present and savouring the future were -0.04

and 0.08, -0.17 and 0.03 and -0.16 and 0.03 respectively. As zero was included in

all three intervals, it can be concluded that the tendency to savour the past, savour

the present and savour the future did not mediate the relationship between trait

depression and resilience.
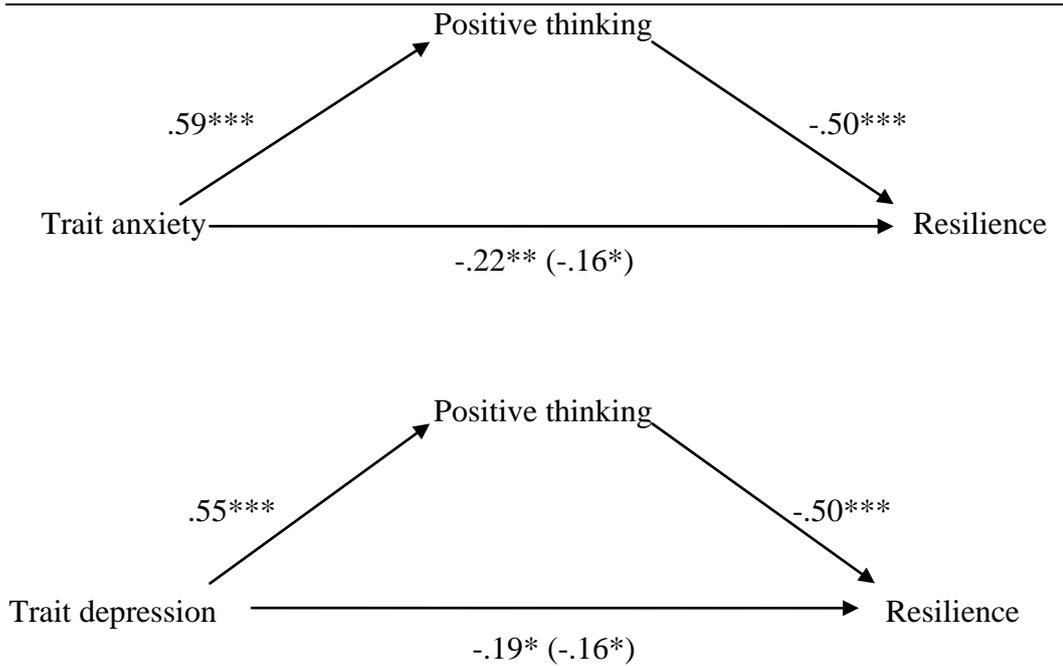
Figure 4.7. Results of the mediation analyses.

4.3.3. Discussion and Conclusions

Optimistic thinking and all three SBI sub-scales were significantly highly

correlated (all ps <.001), suggesting that they may assess the same thinking

construct (positive thinking styles) as has been argued by other researchers

(Lyubomirsky & Layous, 2013; McCullough, Emmons & Tsang, 2002; Seligman,

2006). In further support of this and in line with the hypothesis, all three SBI sub-

scales and the optimistic thinking measure were significantly positively correlated

with resilience and significantly negatively correlated with trait anxiety and trait

depression.

In line with the trait-congruent hypothesis, some differences were observed

in the relationships between the SBI sub-scales and the three negative trait

emotions. The savouring the future sub-scale was significantly negatively related

to trait anger but this relationship was of lower magnitude than the relationships

between this sub-scale and trait anxiety/trait depression. This suggests that, in

line with the hypothesis, trait anger may be less related to future-oriented positive

thinking compared to trait anxiety and trait depression. These results provide

support for the presence of trait-congruent thinking patterns: trait anger was less

related to the future-oriented thinking that has been described as anxiety-

congruent in nature (Borkovec et al., 1998; Starcevic et al., 2007). However, there

were no significant differences for trait anxiety compared to trait depression.

Therefore, the findings provide limited support for the applicability of the trait-

congruent hypothesis to understanding how positive thinking influences student

adjustment.

The trait-congruent hypothesis is further refuted by the fact that not all of

the hypothesised mediating relationships were confirmed. On the one hand, as

anticipated, optimistic thinking significantly mediated the relationship between

trait anxiety and resilience and trait depression and resilience. This supports the

findings of Studies 4 and 5. On the other hand, however, the savouring the future

sub-scale did not mediate the relationship between trait anxiety and resilience and

the savouring the past sub-scale did not mediate the relationship between trait

depression/trait anger and resilience respectively. These results contradict the

trait-congruent hypothesis: they fail to associate future-oriented thinking patterns

exclusively to trait anxiety and past-oriented thinking to trait depression/trait

anger. This suggests that negative trait emotion may not influence students'

resilience through trait-congruent positive thinking styles and thus further

supports the notion that the trait-congruent hypothesis may not be applicable to

understanding how positive thinking influences student adjustment.

4.4   General Discussion and Conclusions

The findings showed that positive thinking was positively correlated with resilience. In addition, in Study 4, positive thinking partially mediated the relationship between trait anxiety and resilience and between trait depression and resilience. These mediations were confirmed in Studies 5 and 6. This supports previous findings concerning the impact of positive thinking on resilience (Carver et al., 1993; Litt et al., 1992; Schok et al., 2010) and highlights positive thinking styles as playing an important role in student adjustment to university life.

Although positive cognitive appraisals were positively related to resilience, Study 4 showed that they failed to mediate the relationship between negative trait emotion and resilience. In addition, Study 5 showed that positive emotions did not influence the impact of positive thinking. These findings contradicted the proposed impact of positive emotions on resilience (Fredrickson & Branigan, 2005; Fredrickson et al., 2003; Ong et al., 2006; Tugade et al., 2004). In particular, these researchers claim that resilience emerges from the consistent practice of positive emotions. They argue that positive emotions generate positive thinking which then aids individuals in finding meaning (Fredrickson, 2001). The current results concerning positive emotions oppose these arguments. They instead suggest that negative trait emotion may influence students' levels of resilience through their longer term cognitive processes and not their automatic cognitive processes. Therefore, the results align with those of Chapter 2 concerning the need to focus on thinking styles within the remaining analyses in order to understand the cognitive processes influencing student adjustment to university life.

Lastly, these findings also contradicted the proposed trait-congruent hypothesis. For instance, the differences predicted in how the processes were related to trait anger, trait anxiety and trait depression did not emerge. In all three studies within this Chapter, optimistic thinking partially mediated the relationship between trait anxiety and resilience as well as between trait depression and resilience but not between trait anger and resilience. This aligns with the similarities between trait anxiety and trait depression that emerged in Chapter 3 where: (1) rumination partially mediated the relationship between trait anxiety and resilience as well as between trait depression and resilience but fully mediated the relationship between trait anger and resilience and (2) worry was related to trait anxiety and trait depression but not to trait anger. Collectively, these results suggest that trait anxiety and trait depression may impact students' resilience through the same cognitive pathway while trait anger may influence students' levels of resilience through a distinct cognitive pathway. This contradicts the proposed relationship between negative trait emotion and distinct trait-congruent cognitions that was put forth by Rosenberg (1998), hinting that student adjustment may not be influenced by trait-congruent thinking styles.

These results may further suggest that, as discussed in Chapter 3, the trait-congruent hypothesis may not be applicable to understanding the impact of longer-term cognitive processes. This is supported by the fact that the majority of evidence in support of trait-congruent cognitions has emerged in studies into automatic cognitive processes. Therefore, in an attempt to further explore the trait-congruent hypothesis, the following chapter will perform an exploratory and a confirmatory factor analysis on the three negative trait emotion measures. This was done to determine whether within the university student population trait

anger, trait anxiety and trait depression represent three independent constructs that

are related to, and thus influence student adjustment through, trait-congruent

thinking styles.

Chapter 5 A factor analysis of trait anger, trait anxiety and trait depression measures

This chapter performs exploratory and confirmatory factor analyses of the trait anger, trait anxiety and trait depression measures to determine the factor structure best suited to exploring the influence of negative trait emotion on student adjustment to university life. This is based on Chapters 3 and 4 where the findings highlighted that trait anxiety and trait depression were related to negative and positive thinking styles in a similar manner; a manner which differed from the relationship between trait anger and these two patterns of thinking.

The thesis' main aim is to determine how negative trait emotion is "cognitively expressed" and how these cognitive "expressions" influence student adjustment to university life. The main argument within this field was proposed by Rosenberg (1998) who claimed that each negative trait emotion was related to specific trait-congruent cognitive processes, what she termed the trait-congruent hypothesis. Therefore, she asserted that each of the three negative trait emotions should be assessed independently. However, the findings thus far appear to contradict her postulations, suggesting instead that negative trait emotion is not cognitively expressed in three, but two, distinct ways. This chapter thus set out to directly explore this: it examined whether negative trait emotion may influence student adjustment through three distinct personality traits - trait anger, trait anxiety and trait depression - which are associated with their own independent cognitive processes.

Research into trait BAS (the disposition towards a more active Behavioural Activation System [BAS]) and trait BIS (the disposition towards a more active

Behavioural Inhibition System [BIS]) suggests that negative trait emotion may be

characterised by two and not three independent traits. Trait BAS involves an

oversensitivity toward signals of reward which causes individuals to relentlessly

seek out rewards within their environment despite risk or threat (Gray, 1991;

Pickering & Gray, 1999). Trait BIS comprises a consistent focus on the avoidance

of harm by persistently scanning the environment for potential threats and

passively avoiding or actively inhibiting responses until safety is assured (Gray,

1991; Pickering & Gray, 1999).

Researchers have linked trait anger, not trait anxiety and trait depression, to

trait BAS (Carver & Harmon-Jones, 2009; Harmon-Jones, 2003; Harmon-Jones &

Harmon-Jones, 2010). In their 2003 study, Harmon-Jones and Harmon-Jones

assessed 164 American undergraduates on measures of BAS/BIS, trait anger and

negative emotions. Their analyses showed that, when controlling for negative

emotions, trait anger was significantly related to the BAS but not to the BIS.

Their findings suggested that, similar to the previous findings of the current

thesis, negative trait emotion may not comprise three independent traits. Instead,

it may consist of two correlated factors differentiated by their relationship to the

BAS/BIS. However, confidence in their postulations is limited by their failure to

include measures of trait depression and trait anxiety: as they did not directly

compare the relationship between the three negative emotions and the BAS/BIS,

only a relationship between trait anger and the BAS was supported.

Furthermore, although other researchers support the suggestion that

negative trait emotion may comprise two, and not three, traits, they contradict

Harmon-Jones and Harmon-Jones' proposals concerning trait anger being

exclusively related to the BAS (Watson & Tellegen, 1985). Watson and Tellegen

asserted that trait BAS was related to positive personality traits and emotions

while trait BIS was associated with negative personality traits and emotions. They

thus claimed that as the three negative trait emotions were characterised by the

tendency to experience reduced positive emotions and increased negative

emotions, they would be related to both trait BAS and trait BIS. In support of

their arguments, the negative trait emotion measures include both positively

worded reverse-scored items such as "I feel happy" as well as negatively worded

items such as "I feel gloomy".

Therefore, although Watson and Tellegen also agreed that negative trait

emotion may be related to trait BAS and trait BIS, these researchers claimed that

the first underlying trait comprised the reduced positive emotions associated with

negative trait emotion while the second underlying trait comprised the increased

negative emotions associated with negative trait emotion. However, their

postulations have not been explored. This chapter examines whether the three-

factor structure proposed by Rosenberg (1998) or either of these two alternative

structures underlie the personality trait – negative trait emotion – and can thus be

used to explore the cognitive processes through which it influences student

adjustment to university life.

5.1. Study 7: Exploratory factor analysis of the trait anger, trait anxiety and trait depression measures

5.1.1. Method

5.1.1.1.   Participants

238 students (122 males and 116 females) took part in the experiment in exchange for course credit or cash. Participants were recruited using the online participant system of the Psychology Department within the University of York. The mean age of the participants were 21.59 years (Range = 18.00 – 46.00). The sample primarily comprised White British (66.8%) with smaller numbers of non-UK European (11.8%), Black British (4.1%), African/Caribbean (5.1%) and Chinese (12.1%) students.

5.1.1.2.   Materials and apparatus

As in Chapter 2, the same three negative trait emotion measures were used to assess negative trait emotion. Trait anger was evaluated using the State-Trait Anger Expression Inventory – 2 (STAXI-II; Spielberger, 1999). Trait anxiety was assessed using the State Trait Anxiety Inventory (STAI; Spielberger et al., 1983). Trait depression was examined using the trait depression subscale of the State Trait Personality Inventory (STPI-TD; Spielberger et al., 1995).

5.1.1.3.   Procedure

The questionnaires were all administered online as part of a battery of measures, the remainder of which are reported in the subsequent Chapters of the thesis. Participants were emailed the link to the survey. The survey began by informing participants about the questions they will be completing and asking

them to give their informed consent by entering their email addresses. This entry

then allowed them to begin filling in the various measures.

5.1.1.4.   *Data analysis*

Exploratory factor analysis (EFA; AMOS version 19.0; IBM software) was

carried out on participants' trait anger, trait anxiety and trait depression scores.

EFA was chosen because the competing models cannot be definitively specified

based on the limited research that exists in the area. In such cases, researchers

claim that EFA provides the best possible explanation for shared variance (Abdi

& Williams, 2010; Cudek, 2000; Fabrigar, Wegener, MacCallum & Strahan,

1999; Kline, 1994).

The Kaiser-Meyer-Olken measure verified the sampling adequacy

(KMO=0.93) and the Bartlett's test of sphericity was significant ($p <.001$),

indicating that the necessary correlations between items were present. Researchers

state that while normality enhances the solution for EFA, it is not essential

(Fabrigar et al., 1999; Tabachnick & Fidell, 2007). Therefore, although the

Kolmogorov-Smirnov test revealed that the scores for all variables were

significantly skewed, no deletion or transformation of scores was performed. This

was also decided for two reasons. Primarily, visual inspection of the histograms

suggested the scores were only slightly skewed (Field, 2009; Pallant, 2007). In

addition, the data met the other criteria associated with increasing the accuracy of

EFA: (1) it had a sample size of at least 200 participants; (2) its proposed factors

were measured by more than 3 items; (3) its ratio of subjects to variables was

119:19 which is higher than the minimum of 2:1; and (4) its communalities were

between 0.40 and 0.70 on average (Kline, 1994; Fabrigar et al., 1999).

5.1.2.   Results

5.1.2.1.   Number of factors extracted

A principal components factor analysis without rotation was initially

performed to determine the number of factors to be extracted (Fabrigar et al.,

1999). Here, in addition to Cattell's scree test (Cattell, 1966) and the Kaiser

criterion (Kaiser, 1960), parallel analysis (Montanelli & Humphreys, 1976) was

used. Parallel analysis operates by randomly generating "parallel" factors which

are compared to factors within the real data. Any factors within the dataset whose

eigenvalues exceed the eigenvalues of these parallel factors are considered

statistically significant and are thus retained.

The Kaiser criterion and parallel analysis suggested that four factors existed

whereas the scree plot suggested that two factors were present (Field, 2009). The

reliability of the Kaiser criterion may have been constrained as not all

communalities were above 0.70 and the sample size was less than 250 (Field,

2009). In addition, the parallel analysis may have been biased by the deviations

from normality present in the current data set (Horn, 1965; O'Connor, 2000;

Hayton , Allen & Scarpello., 2004; Liu & Rijmen, 2008). Nonetheless, two

principal axis factor analyses with varimax rotation were performed to compare

the proposed two- and four-factor models. A minimum loading exclusion criterion

of 0.30 was applied (Fabrigar et al., 1999; Kline, 1994). Varimax rotation was

chosen because the hypothesised model suggested the presence of three

independent factors (Rosenberg, 1998).

5.1.2.2.   *Extraction of factors*

5.1.2.2.1.   *Two-factor solution*

Within the two factor solution (see Appendix D), the first factor was

defined by high loadings on the 20 items of the STAI and the 10 items of the

STPI-TD. Item loadings ranged from 0.41 to 0.77. The highest loadings were for

the items "I feel peaceful" (0.77), "I feel happy" (0.77) and "I am content" (0.77).

These items had been reverse-scored, so higher values meant that participants

were less likely to feel "peaceful", "happy" and "content". The second factor was

defined by high loadings on 8 of the items within the STAXI-II, with item

loadings ranging from 0.50 to 0.78. The highest loadings were for items "I am a

hot-headed person" (0.78) and "I am quick tempered" (0.73). The two filler items

of the STAXI-II failed to load onto either factor. These items included "When I

get mad, I say nasty things" and "When I get frustrated, I feel like hitting

someone".

There were ten double loadings including items such as "I feel nervous and

restless" with loadings of 0.47 for factor 1 and 0.35 for factor 2; "I have

disturbing thoughts" which loaded at 0.44 on factor 1 and 0.35 on factor 2; and "I

worry too much over something that really doesn't matter" which loaded on

factors 1 and 2 with loadings of 0.49 and 0.34 respectively. The differences

between the loadings on factors 1 and 2 for all ten items were large suggesting

that they were not strongly related to factor 2. This is further emphasised by the

fact that the majority of the loadings onto factor 2 for all items were under the

more conservative critical value of 0.40 (Fabrigar et al., 1999). These items were

thus retained under Factor 1.

5.1.2.2.2.   *Four-factor solution*

Within the four factor solution, the loadings on the first two factors were largely similar to that of the two-factor solution (see Appendix E). The third factor was defined by double loadings on three items "Some unimportant thought runs through my mind and bothers me" (-0.34), "I have a fiery temper" (0.39) and "I am a hot-headed person" (0.33). The latter two of these three items also loaded onto factors 1 and 2, with loadings of 0.66 and 0.75 respectively onto factor 2 and a loading of 0.31 for both items onto factor 1. The remaining item loaded onto factor 1, with a loading of 0.54. The fourth factor incorporated four items which also loaded onto factor 1: "I lack self- confidence" had loadings of 0.30 and 0.61 respectively. "I feel depressed" had loadings of -0.31 and 0.73 respectively. "I feel sad" had loadings of -0.33 and 0.65 respectively. "I am cool, calm and collected" had loadings of 0.42 and 0.49 respectively. Therefore, factors 3 and 4 had no distinguishable structure, increasing confidence in the two-factor solution.

5.1.2.2.3.   *Additional analyses*

As a further check on the validity of the two-factor structure, three additional analyses were performed: (1) a one-factor unrotated solution (2) a two-factor model derived using an oblique rotation and (3) a three-factor model derived using an orthogonal rotation. The one-factor unrotated solution was done to substantiate that an underlying factor structure existed. The two-factor oblique rotation was done to assess the independence of the two-factor structure that emerged. The three-factor orthogonal model was done to assess the fit of the hypothesised model.

Within the one-factor model (see Appendix F), six of the items failed to

load: "I am quick tempered', "I have a fiery temper", "I am a hot-headed person",

"I get angry when I am slowed down by others' mistakes", "When I get mad, I

say nasty things" and "When I get frustrated, I feel like hitting someone". These

results suggest that a one-factor solution was not applicable, and an underlying

factor structure existed.

The structure matrix of the oblique rotation was consulted in order to ensure

an accurate interpretation of the relationships between the various items of the

two measures (Field, 2013; Graham, Guthrie & Thompson, 2003). The oblique

rotation produced similar loadings as the orthogonal two-factor model (see

Appendix G). This suggested that the two factors represented the true underlying

factor structure as they emerged regardless of the analyses used. The two factors

were modestly correlated ($p = .318$), adding confidence to the oblique solution.

Furthermore, unlike with the orthogonal solution, this solution showed no double

loadings. This hints that an oblique model may be a more accurate representation

of the factor structure underlying negative trait emotion.

For the three-factor model (see Appendix H), the factors extracted were not

defined by the items on each measure as proposed by Rosenberg (1998). Instead,

Factor 1 was largely defined by the items of the STPI-TD and the STAI. Among

these items, there were two double loadings. One of these items – "Some

unimportant thought runs through my mind and bothers me" – loaded 0.54 onto

Factor 1 and -0.35 onto Factor 3. The other item – "I feel peaceful" – loaded onto

Factor 1 (0.68) and Factor 2 (-0.37). However, these differences were sufficiently

large in favour of Factor 1, indicating that they mainly defined Factor 1. Factor 2

was mainly defined by the items from the STAXI-II. Of these 10 items, two failed to load. In addition, four items also loaded only onto Factor 1 while two also loaded onto Factors 1 and 3 and. However, the majority of these differences were again sufficiently large in favour of Factor 2, indicating that they mainly defined Factor 2. As previously discussed, Factor 3 was defined by three double-loaded items: one also loaded onto Factor 1 while the other two loaded onto Factors 1 and 2. However, as detailed above, all three items were more strongly related to either Factor 1 or Factor 2. The pattern of these shared loadings suggests that Factors 1 and 2 reflected the two-factor solution previously obtained. It thus refuted the proposed three-factor solution put forth by Rosenberg (1998).

Consequently, in conjunction with the law of parsimony (Kline, 1994), a two factor oblique model was retained as it produced the simplest, most theoretically understandable and thus readily interpretable pattern of results (Fabrigar et al., 1999; Kline, 1994). The factor loadings aligned with the postulations of Harmon-Jones and colleagues (Carver & Harmon-Jones, 2009; Harmon-Jones, 2003; Harmon-Jones & Harmon-Jones, 2010). Therefore, Factor 1 was labeled "Trait Inhibition". This term was coined by Watson and Clark (1984) to describe the personality trait underlying the BIS. Factor 2 was labeled "Trait Activation".

5.1.2.2.4.   *Reliability analysis*

The internal consistency of the two factors was assessed using Cronbach's α (Cronbach, 1947). Both factors had high reliabilities. The Cronbach's α for Trait Inhibition was 0.93 and the Cronbach's α for Trait Activation was 0.86. Based on

the high alphas, no items were deleted. These results increased confidence in the

two factor structure that emerged.

5.1.3. Discussion and Conclusions

The findings refuted the hypothesis: the three independent traits proposed

by Rosenberg (1998) failed to emerge. Instead, the results suggested that negative

trait emotion may be characterised by a two-factor oblique model. This means

trait anger, trait anxiety and trait depression are best represented not as three

independent traits, but rather as two correlated traits related to trait BAS and trait

BIS. This aligns with previous findings in the thesis, specifically the similarities

that emerged between trait anxiety and trait depression in Chapters 3 and 4. It also

contradicts the trait-congruent hypothesis and the importance of its postulated

independent trait-congruent cognitive pathways to understanding student

adjustment. However, the oblique and orthogonal models both presented similar

findings. Therefore, within the next study, these two will be compared within a

confirmatory factor analysis (CFA; AMOS version 19.0; IBM statistics).

5.2. Study 8: Confirmatory Factor Analysis of the trait anger, trait anxiety
and trait depression measures

The CFA compares the two factor oblique solution to the two factor

orthogonal model. The main difference between these two models is how they

claim the two factors are related. On the one hand, within the oblique model,

these factors are correlated: this suggests that individuals' levels of Trait

inhibition influence their levels of Trait Activation and vice versa. This aligns

with the proposed relationship between the behavioural inhibition (BIS) and the

behavioural activation (BAS) systems where Gray (1991) argued that individuals

levels of trait BAS will influence their levels of trait BIS.

On the other hand, within the orthogonal model, it is postulated that these

factors are independent. This means that individuals' levels of Trait Inhibition do

not influence their levels of Trait Activation. Based on the arguments of Harmon-

Jones and colleagues (Carver & Harmon-Jones, 2009; Harmon-Jones, 2003;

Harmon-Jones & Harmon-Jones, 2010), it is hypothesised that the two factor

oblique model will emerge as the better fit to the data.

5.2.1. Method

5.2.1.1.   *Participants*

A new sample of 386 students (175 males and 211 females) from the

University of York was recruited for this study. The sample was obtained using

the online participant pool managed by the Psychology Department within the

University of York. Participants received either course credit or payment in return

for their participation. The sample included predominantly White British (48.7%)

and Chinese (23.4%) students. The remainder of the sample comprised Black

British (1.3%), Asian British (1.8%), African/Caribbean (5.2%), White American

(0.3%), Asian (4.3%) and non-UK European (15.0%) students. The mean age of

the sample was 21.81 years (Range = 18.00 – 42.00).

5.2.1.2.   *Materials and apparatus*

Based on the results of the EFA performed in the previous study, Factor 1

(henceforth referred to as Trait Inhibition [TInh]) was evaluated using 20 items

from the trait anxiety subscale of the State-Trait Anxiety Inventory (STAI;

Spielberger et al., 1983) and 10 items from the trait depression subscale of the

State-Trait Personality Inventory (STPI-TD; Spielberger et al., 1995). Factor 2

(henceforth referred to as Trait Activation [Tact]), was assessed with 8 items from

the trait anger subscale of the State-Trait Anger Expression Inventory- 2 (STAXI-

II; Spielberger, 1999).

5.2.1.3.   Procedure

The questionnaires were all administered online as part of a battery of

measures. Participants were emailed the link to the survey. The survey began by

informing participants about the questions they would be completing and asking

them to give their informed consent by entering their email addresses. This entry

then allowed them to begin filling in the various measures.

5.2.1.4.   Data analysis

Confirmatory Factor Analysis (CFA; AMOS version 19; IBM software)

was used to perform the assessment. CFA evaluates the goodness of fit of the

proposed model (the two-factor oblique model derived from the EFA) by

determining the amount of variance that remains unexplained when it is fitted to

the data (Floyd & Widaman, 1995). Maximum likelihood analysis (ML) was

applied within the CFA to deduce the goodness of fit of the oblique two-factor

model. ML was chosen because it is the most highly recommended procedure

within CFA (Fabrigar et al., 1999; Beauducel & Herzberg, 2006; Flora & Curran,

2004; Lei, 2009; Rhemtulla, Brosseau-Liard & Savalei, 2010; Salisbury, Pearson,

Pearson & Miller, 2001; Schmitt, 2011; Simon & Tovar, 2004).

Similar to Studies 2 and 5, in addition to the chi-square (χ^2) test, four

approximate fit indices (AFIs) were used: (1) Root Mean Square Error of

Approximation (RMSEA), (2) Bentler Comparative Fit Index (CFI), (3) the

Tucker-Lewis index (TLI) and (4) the Akaike Information Criterion (AIC). For

the χ^2, a non-significant result signalled that the model was a good fit. A cut-off of

0.95 was used for the CFI and the TLI, as for these AFIs values close to 1.00

indicated the best fit (Hu & Bentler, 1999; Kline, 2011). For the RMSEA, values

≤ 0.05 indicated close approximate fit, values between 0.05 and 0.08 suggested

reasonable fit, and values ≥ 0.10 suggested poor fit. Therefore, a cut-off of 0.05

was used. As in Studies 2 and 5, for the AIC, values for both models were

compared and the model with the lowest AIC was labelled the better fit to the

data.

In addition, as in Studies 2 and 5, a sequential χ^2 difference test was used to

compare the goodness of fit of the oblique two-factor model to the fit of an

alternative theoretically derived nested model – the orthogonal two-factor model

(Anderson & Gerbing, 1988; Byrne, 2010; Houghton & Jinkerson, 2007).

Sequential χ^2 difference tests compare the fit of the hypothesised model (the

oblique two-factor model) to the competing model (the orthogonal two-factor

model) and determine whether they significantly differ on the χ^2 statistic and the

four AFIs described above (Anderson & Gerbing, 1988; Houghton & Jinkerson,

2007). According to Houghton and Jinkerson (2007), if the fit indices

significantly differ, the better fitting model is retained. However, if the fit indices

are not significantly different (their values remain unchanged or only slightly

worsen), this means that there is little difference between the two models being

compared and thus the more parsimonious of the two should be retained.

5.2.2.   Results

5.2.2.1.   *Preliminary analyses*

The data only met two of the three main assumptions associated with ML:

(1) it had more than 150 participants (this is the minimum sample size when

factor loadings are above 0.4; see Appendices D and G) (Byrne, 2001; 2010;

Floyd & Widaman, 1995; Guadagnoli & Velicer, 1988) and (2) its variates and

their residuals were independent (all rs were less than 0.70). The third assumption

was not met as variables remained skewed in spite of the logarithmic

transformations and the removal of outliers (Pallant, 2007). Under such deviations

in normality, researchers claim that ML underestimates standard errors and

therefore increases the likelihood of Type II error (Ichikawa & Konishi, 1995).

Therefore, to control for this inflated Type II error, bootstrapping was

applied to the ML analysis within the CFA (Arbuckle, 2010; Efron & Tibshirani,

1993; Zhu, 1997). Here, bootstrapping was chosen for three main reasons: (1) it

makes adjustments for non-normal data (as is present in the current data set) and

thus enables ML to be accurately applied when normality is violated; (2) it is

recommended when factors are defined by a large number of indicators (factor 1

is defined by 30 items); and (3) its accuracy is increased when sample sizes are

greater than 200 (the current sample size is 386) (Bone, Sharma & Shimp, 1989;

Nevitt & Hancock, 2001). Bootstrapping utilizes sampling distributions to

calculate the goodness of fit of the model. These sampling distributions are

developed using large numbers of subsamples of equal size generated randomly

with replacement from the data set. Generally more than 1,000 bootstrap samples

are recommended for CFAs (Efron & Tibshirani, 1993). Therefore, 2,000

resamples were used in the analysis .

5.2.2.2.   Confirmatory factor analysis of the two-factor models

Results of the CFA are shown in Table 5.1. The oblique model emerged as

the better of the two models (χ^2 [664, N=386] = 2723.25, p <.001, TLI=0.67,

CFI=0.65, RMSEA=0.09, AIC=2877.25). However, this was solely based on the

findings of the AIC. The remaining AFIs and the χ^2 suggested that neither model

was a good fit to the data. This was further supported by the χ^2 difference test

which showed that the fit of the two models did not significantly differ (p= .503).

In addition, an analysis of the standardised residual covariance matrix showed

that the covariances for over 20 items exceeded the critical ratio value of 2.58.

This indicated that the model did not adequately explain the associations between

the items (Kline, 2011).

5.2.2.3.   Re-specification of the two-factor models

Modification indices (MIs) suggested that the models could be improved if

some error terms were allowed to covary. Thus revised models were constructed

which allowed the errors with significant MIs to correlate. The results of the CFA

on these respecified models are presented in Table 5.2. The AIC again suggested

that the oblique factor solution was the better of the two models (χ^2 [650, N=386]

= 2599.13, p <.001, TLI=0.66, CFI=0.69, RMSEA=0.09, AIC=2781.13).

However, the χ^2 and the remaining AFIs again highlighted both models as poor

fits to the data. In both cases, this was further emphasised by the fact that no

significant difference was found between the fit of the two models (p = .524) and

several residuals remained significantly high (>2.58).

However, researchers assert that the accuracy of χ^2 and the other AFIs are

negatively influenced when the latent factors are defined by a large number of

indicators (Bone, Sharma & Shimp, 1989; Floyd & Widaman, 1995; Hall, Snell &

Foust, 1999; Kline, 2011). They claim that by chance 1 in 20 items are

significantly related and thus in cases with a large number of indicators, these

Table 5.1

Summary of the goodness of fit indices for the two competing two-factor models

Models	χ^2 (df)	TLI	CFI	RMSEA (90% CIs)	AIC	χ^2 difference test
				Goodness of fit indices		
Optimal value	Non-significant	≥ 0.95	≥ 0.95	≤ 0.05	Lower value	
Two-factor orthogonal model	2756.64*** (665)	0.67	0.65	0.09 (0.086 - 0.094)	2908.64	
Two-factor oblique model	2723.25*** (664)	0.67	0.65	0.09 (0.086 - 0.093)	2877.25	0.91 (1)

Notes: ***$p < .001$.

Table 5.2

Summary of the goodness of fit indices for the two competing two-factor models following respecification according to the MIs

Models	χ^2 (df)	Goodness of fit indices				χ^2 difference test
		TLI	CFI	RMSEA (90% CIs)	AIC	
Optimal value	Non-significant	$\geq$0.95	$\geq$0.95	$\leq$0.05	Lower value	
Two-factor orthogonal model	2635.43*** (651)	0.66	0.68	0.09 (0.085 - 0.093)	2851.43	
Two-factor oblique model	2599.13*** (650)	0.66	0.69	0.09 (0.085 - 0.092)	2781.13	1.75 (1)

Notes: ***p <.001.

spurious correlations can lead to high residuals which subsequently cause Type II

error. Therefore, the presence of high residuals within the current study suggests

that the fact that factor 1 was defined by 30 items may have erroneously led to the

model being rejected.

Researchers claim that these errors can be avoided when each factor is

limited to being assessed by three indicators (Hall et al., 1999; Hau & Marsh,

2004; Kline, 2011). They argue that three indicators generate a just-identified

model which "optimally captures the relations among items, no matter what other

constructs are considered or included in the model" (Little, Cunningham, Shahar

& Widaman, 2002, p. 162). Therefore, to produce this more optimal factor

structure, parcelling was applied.

5.2.2.4.   Parcelling

Parcelling reduces various items into a single variable by aggregating or

averaging items into groups or "parcels" and these "parcels" replace the items as

manifest indicators within the analysis (Haul et al., 1999, p. 261). As a result, it

decreases the number of manifest indicators within the model, minimizing the

probability of Type II error caused by spurious correlations. Parcelling also

reduces the non-normality which may inaccurately lead to rejection of the model

(Floyd & Widaman, 1995; Little et al., 2002; Hau & Marsh, 2004). This was

pertinent to the study given the positive skew of the negative trait emotion scores

within the current data set. Lastly, parcels increase the participant-to-variable

ratio. As larger ratios are recommended in the literature (Floyd & Widaman,

1995; Byrne, 2001; 2010), its use thus provided the added advantage of

improving the participant-to-variable ratio that was present in the prior CFA.

However, researchers assert that parcelling also leads to inflated Type I

error since it operates by combining errors (Bagozzi & Heatherton, 1994; Hall et

al., 1999; Little et al., 2002). To reduce the likelihood of this associated Type I

error, these researchers recommend that unidimensional parcels should be

constructed; parcels in which each dimension that exists in the data is represented

by its own unique parcel (Bagozzi & Heatherton, 1994; Little et al., 2002; Hall et

al., 1999). This was attempted in the current analysis.

5.2.2.4.1. *Building unidimensional parcels of the trait anxiety, trait anger and trait depression items*

Unidimensional parcels were created by aggregating item scores using the

isolated uniqueness strategy recommended by Hall, Snell and Foust (1999). This

strategy was chosen for two main reasons. Primarily, researchers have argued that

Likhert scales with fewer categories (generally 5 or less) tend to be ordinal in

nature (Bryman & Cramer, 2011; Floyd & Widaman, 1995). Aggregation

generates normality by making scale intervals smaller and more continuous in

nature (Little et al., 2002). The aggregation method was thus deemed pertinent

given that all items were assessed on 5-point scales.

Secondly, according to Haul, Snell and Foust (1999) unidimensional parcels

emerge when parcels have both internal consistency (items share common

variance) and external consistency (items within a parcel are equally affected by

secondary influences). The researchers asserted that the isolated uniqueness

strategy is the only strategy that ensures both internal and external consistency: it

isolates the impact of any secondary influences within one parcel by combining

highly correlated items within the same parcel. As such, it ensures that the

uniqueness of the parcel would be correctly interpreted as error variance, leading

to more accurate parameter estimates.

As a starting point, in order to determine the highly correlated variables to

be included within each parcel, two EFAs were run. The first EFA was performed

on the items of the Trait Inhibition factor derived from Study 7. The second EFA

was run on the items of the Trait Activation factor derived from Study 7. For each

of these EFAs, a three factor solution was specified based on three indicators

being the optimum number of items that should define a factor (Hau & Marsh,

2004; Kishton &Widaman, 1994). Three parcels were successfully derived for

each factor (see Table 5.3), supporting the use of parcelling (Hau & Marsh, 2004).

The reliabilities of the various parcels ranged from 0.53 to 0.88. However, the

lower alphas (0.53 and 0.67) may have been caused by these parcels (Activation 2

and Activation 3) only having two items. Therefore, all parcels were retained

(Hau & Marsh, 2004).

5.2.2.4.2.   *Evaluation of the model fit using the parcels as manifest*

   indicators

CFA (ML with bootstrapping [2000 resamples]) was performed using the

parcels. Bootstrapping was again used because Activation 1 and Activation 3

were not normally distributed. The results of the CFA are reported in Table 5.4.

Using the parcels drastically improved the fit of both models to the data.

However, the oblique model emerged as a better fitting model (χ^2 [8, N=386] =

17.38, *ns*, TLI=0.97, CFI=0.99, RMSEA=0.06, AIC=43.38). This difference in fit

was significant (p<.05).

Table 5.3

The characteristics of each parcel including number of items and cronbach's

alphas

Factor	Parcel	Number of items	Reliability
Trait Inhibition	Inhibition 1	10	0.88
	Inhibition 2	11	0.87
	Inhibition 3	9	0.86
Trait Activation	Activation 1	4	0.84
	Activation 2	2	0.67
	Activation 3	2	0.53

Several further analyses were thus performed on the two-factor oblique

model to evaluate its credibility. These included an examination of the

modification indices (MIs), the standardised factor loadings, the squared multiple

correlations and the level of correlation between the two factors. The MIs were

not significant, hinting that the model needed no further re-specification. The

standardised factor loadings were all significant (all ps $<.001$), highlighting the

presence of convergent validity (Byrne, 2010; Kline, 2011) (Table 5.5).

Convergent validity was further supported by the resultant squared multiple

correlations (R^2_{smc}). For each indicator, R^2_{smc} was greater than or equal to 0.50,

suggesting that the factors explained an adequate amount of variance in all their

associated parcels (Byrne, 2010; Kline, 2011) (Table 5.5). The presence of

Table 5.4

Summary of the goodness of fit indices for the two competing two-factor models using parcels

Models	χ^2 (df)	TLI	CFI	RMSEA (90% CIs)	AIC	χ^2 difference test
				Goodness of fit statistics		
Optimal value	Non-significant	≥.95	≥.95	≤.05	Lower value	
Two-factor orthogonal model	71.50*** (9)	0.83	0.90	0.13 (0.106 -0.102)	95.50	
Two-factor oblique model	17.38 (8)	0.97	0.99	0.06 (0.018-0.091)	43.38	7.01* (1)

Notes: *** $p <.001$, * $p <.05$.

discriminant validity was indicated by the factors not being highly correlated (r <.90) (Kline, 2011).

As a further check of overall discriminant validity, the model was assessed against another alternative nested model (Brooke, Russell & Price, 1988; Prussia, Anderson & Manz, 1998). Within this alternative model, the correlations between all the latent variables were constrained to 1, essentially leading to a "single-factor model" (Prussia et al., 1998, p. 532). This was done to ensure that the two factors represented distinct constructs. The fit of this single-factor model to the data was first analysed using the chi-square (χ^2) test within the CFA. Then a χ^2 difference test was used to compare the χ^2 obtained for the two-factor oblique model and the χ^2 obtained for this single-factor model. The χ^2 value of the two-factor oblique model was significantly lower (χ^2 (1, 386) = 30.828, p<.001), indicating the presence of discriminant validity.

Table 5.5

Standardised and unstandardised factor loadings and R^2_{smc} for the two-factor oblique model

| Parcel | Factor loadings | | | |
	Unstandardised estimates	SE	Standardised estimates	R^2_{smc}
Inhibition 1	4.20	0.29	0.71	0.50
Inhibition 2	3.86	0.26	0.72	0.52
Inhibition 3	4.18	0.24	0.86	0.74
Activation 1	2.05	0.18	0.78	0.61
Activation 2	1.55	0.09	0.82	0.66
Activation 3	2.04	0.13	0.77	0.60

5.2.3. Discussion and Conclusions

This study performed a CFA of the two factor structure that emerged in Study 7. The hypothesis was confirmed: the oblique two-factor model again provided the better explanation of the factor structure underlying negative trait emotion. The results align with the findings of the EFA: they refuted the trait-congruent hypothesis and the importance it places on three independent negative trait emotions. The findings instead suggest that negative trait emotion may exert its impact on student adjustment through two correlated traits related to trait BAS and trait BIS, labelled Trait Activation and Trait Inhibition respectively.

5.3.   General Discussion and Conclusions

This Chapter aimed to determine the factor structure through which negative trait emotion exerted its impact on student adjustment to university life. The EFA and CFA both suggested that a two-factor oblique model was the most appropriate. Confidence in the findings is increased by the various analyses run - such as Cronbach alphas, MIs, standardised residuals, factor correlations and factor loadings - which highlighted the reliability and validity of the two factor structure derived.

This two-factor structure contradicted the proposals of Rosenberg (1998). Rosenberg asserted that the traits underlying negative trait emotion were independent of one another and as such each trait exerted an independent impact on individuals' behaviour, in this case, students' levels of resilience. However, the results failed to support a three-factor orthogonal solution, suggesting that negative trait emotion does not influence students' resilience through three

independent cognitive pathways associated with trait anger, trait anxiety and trait depression.

Instead, the findings revealed that a two-factor oblique solution provided the best fit to the data. Research hinted that the two factors that emerged may be related to the behavioural activation and inhibition motivational systems (Gray, 1991). Two competing arguments existed; the first of these were put forth by Watson and Clark (1984) and the other by Harmon-Jones and colleagues (Carver & Harmon-Jones, 2009; Harmon-Jones, 2003; Harmon-Jones & Harmon-Jones, 2010).

The relationship that emerged contradicted the postulations of Watson and Clark who suggested that trait anger was related to high trait BIS and low trait BAS. Contrary to their predictions, Factor 1 was not defined by the negatively-worded items of the three measures and Factor 2 was not defined by the reverse-scored positively worded items. The findings instead supported the results of Harmon-Jones and colleagues who indicated that the BAS was associated with trait anger (Carver & Harmon-Jones, 2009; Harmon-Jones, 2003; Harmon-Jones & Harmon-Jones, 2010). In the current study, Factor 2 was defined by the items of the trait anger measure, hinting at an association between Factor 2 and trait BAS as suggested by the researchers. Factor 2 was thus labelled trait activation – defined as the disposition toward extreme hypersensitivity to reward cues within the environment and an increased likelihood of responding to these cues in spite of potential danger.

In addition, Factor 2 was correlated with Factor 1. This also supported the proposed relationship between negative trait emotion and the BAS/BIS.

Researchers assert that the BAS and BIS systems are correlated, but this represents a weak relationship (Gray, 1991; Pickering & Gray, 1999). According to Gray (1991), individuals are either high on trait BAS or high on trait BIS; they cannot have high levels of both traits. As such, they may either more readily notice reward cues in their environment (higher levels of trait BAS) or be more likely to notice and avoid danger cues in their environment (higher levels of trait BIS). The low correlations between the factors mirror the arguments of Gray concerning the proposed association between the BAS and the BIS. They thus hint at an association between Factor 1 and the BIS. Factor 1 was thus labelled trait inhibition – defined as the tendency toward persistent hypervigilance for and avoidance of negative cues within the environment.

The current findings suggested the need to explore the influence of negative trait emotion on student adjustment to university life by examining trait inhibition and trait activation rather than trait anger, trait anxiety and trait depression independently. This supports the findings of Chapters 3 and 4 where the results did not confirm the relationship between negative trait emotion and trait-congruent negative and positive thinking styles. Therefore, for the remainder of the thesis, the impact of negative trait emotion on student adjustment will be evaluated by assessing the relationship between trait inhibition and students' levels of resilience as well as between trait activation and students' levels of resilience.

Chapter 6 An exploration of the influence of complex positive and complex negative thinking styles

This chapter explores the influence of complex positive thinking styles and complex negative thinking styles as discussed in Chapter 2. Here, findings were outlined which showed that complex positive thinking styles and complex negative thinking styles may influence student adaptation to university life (Jackson et al., 2000; Pancer et al., 2000). For instance, Jackson et al. (2000) found that complex positive thinking had a greater impact of on student adjustment to university than positive thinking that was not complex in nature. In line with these findings, this chapter evaluates whether complex positive thinking styles and complex negative thinking styles exert a greater impact on how students adjust to the University of York compared to positive and negative thinking styles.

Previous research assessed complex positive thinking and complex negative thinking by evaluating students' levels of positive academic expectations as regards their grades and university life (Jackson et al., 2000; Pancer et al., 2000). For example, for Pancer et al., complex negative thinking was epitomised in statements such as: "I think the change in my lifestyle would be my biggest fear'. Moving away from home, meeting all new people, and a stricter academic schedule all mould together to cause a sense of insecurity" (Pancer et al., 2000, p. 45). Pancer et al. argued that this student showed complex negative thinking in three ways: (1) he/she evidenced differentiation (addressed the various dimensions of the university experience) by his/her awareness of the various aspects of university life such as "moving away from home" and "meeting new people"; (2) he/she showed integration

(considered how these various dimensions were related to one another) by his/her

consideration of how these various dimensions would "mould together" and (3)

he/she signalled negative thinking by his/her contemplation of "fear" and "a sense of

insecurity".

Conversely, this study attempts to evaluate the impact of a more generalized

complex positive thinking style and complex negative thinking style – students' more

pervasive and characteristic forms of thinking not specifically related to how they

think about university. Research has not explored this more pervasive form of

complex positive thinking and complex negative thinking on student adjustment to

university life. However, studies have examined the impact of this pervasive complex

thinking style on student adjustment (Pennebaker, Mayne & Francis, 1997).

Pennebaker et al. (1997) found that increases in this complex thinking style

were linked to better physical and academic functioning among 177 participants (119

of who were college students). Physical functioning was evaluated by calculating

changes in the frequency of health care visits from varying times before data

collection (2 – 4 months) to varying times after data collection (6 weeks - 6 months).

Academic functioning was assessed using changes in grade point averages from the

term in which data collection occurred to the following term. Within their study,

complex thinking was evaluated by giving students 20 minutes to write on a topic,

either their deepest thoughts and feelings about coming to university or the most

traumatic experience in their lives. These essays were assessed by evaluating

students' use of words listed from the "insight" linguistic scale of the Linguistic

Inquiry and Word Count programme (LIWC; Francis & Pennebaker, 1993). The

LIWC is a word count programme which searches specific texts (in this case

students' writings) and calculates the frequency with which certain words are used. It

incorporates approximately 61 scales; for example, in addition to the "insight" scale,

there are scales such as "prepositions" and "conjunctions".

The "insight" scale used in the current study evaluates the frequency with

which students incorporated words that researchers claim are reflective of engaging

in complex thoughts such as "realize", "see" and "understand" (Owens & Wedeking,

2011; Pennebaker & King, 1999; Slatcher, Chung, Pennebaker & Stone, 2007). This

scale produced high binary alphas in previous research (0.77), adding reliability to

the results; a binary alpha is a measure of the relationship between the results of the

LIWC scale and the ratings of independent judges (Francis & Pennebaker, 1993;

Pennebaker & Francis, 1996). Within their analysis, Pennebaker et al. (1997) linked

the increased use of "insight" words to better physical and academic functioning.

However, the results were based on analyses using the entire sample (119 university

students, 38 maximum security male inmates and 20 recently unemployed male

professionals). Therefore, from the findings, it cannot be deduced whether among

university students, a relationship exists between the use of "insight" words (levels of

complex thinking) and participants' physical and academic functioning.

Furthermore, within the study, Pennebaker et al. (1997) failed to find a

relationship between the use of "insight" words and emotional functioning. However,

additional research performed by the same researchers (Pennebaker et al., 1997)

sheds insight on this relationship. The study's findings suggested that complex

thinking (also assessed by evaluating participants' use of "insight" words) was

negatively correlated with emotional adjustment in a sample of 86 HIV-positive and

167 HIV-negative partners of men with AIDS. Emotional adjustment was assessed

using the Positive States of Mind Scale (Horowitz, Angler & Kegeles, 1988). This

measure assessed participants' levels of pleasure, productivity, focused activity and

connection with others, and has yielded a high alpha of 0.80., adding confidence in

the findings. These results suggest that complex thinking may not exert a positive

impact on emotional adjustment. However, this study was not performed using

university students and did not evaluate the complex positive and complex negative

thinking styles that are the focus of the current analysis. Therefore, the impact of the

more pervasive complex positive and complex negative thinking on student

adjustment warrants further investigation.

6.1.   Study 9: An exploration of the influence of complex positive and complex negative thinking

This study tests the model depicted in Figure 6.1. It was hypothesised that trait

activation, trait inhibition and complex negative thinking will all be negatively

related to resilience. In addition, it was hypothesised that trait activation and trait

inhibition will be negatively related to complex positive thinking. On the other hand,

positive relationships were anticipated between: (1) complex positive thinking and

resilience and (2) trait activation, trait inhibition and complex negative thinking.

Significant partial mediating relationships are predicted as detailed in Figure 6.1.
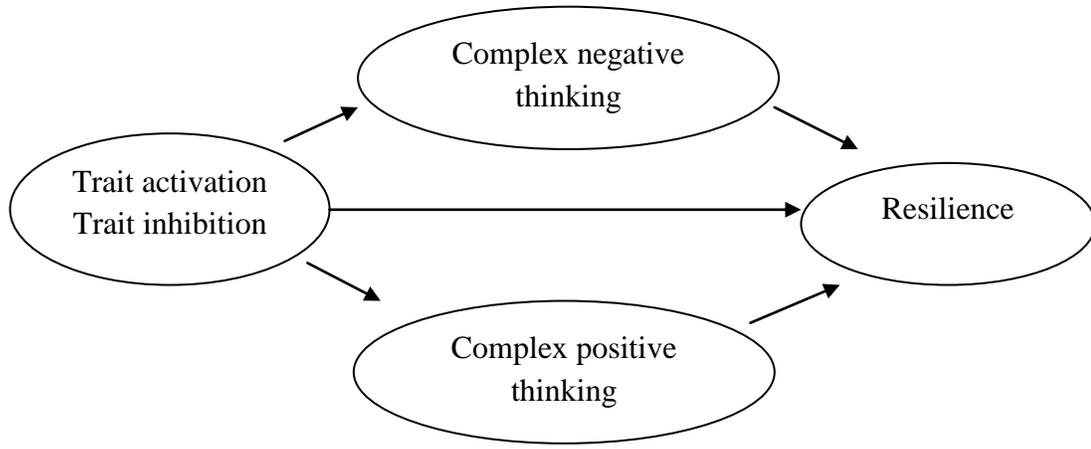
Figure 6.1. Graphic representation of the partial mediation model being evaluated in

Study 9.

6.1.1. Method

6.1.1.1.   Participants

A new sample of 324 students (269 females and 55 males) was recruited for

this study using posters around the University of York campus and the research

participants' pool of the Psychology Department of the University. The mean age of

the participants were 19.95 years (Range = 18.00 – 44.00). The sample primarily

comprised White British students (62.45%) with smaller numbers of Black British

(0.62%), Asian British (3.40%), non-UK Europeans (10.80%), Chinese (18.83%) and

African/Caribbean (3.90%) students.

6.1.1.2.   Materials and apparatus

(1) Trait inhibition was evaluated using the scale derived following the factor

analyses reported in Chapter 5. This scale included 10 items from the trait depression

subscale of the State-Trait Personality Inventory (STPI-TD; Spielberger et al., 1995)

and 20 items from the State-Trait Anxiety Inventory (STAI ; Spielberger et al.,

1983). Within this study, the scale had high reliability (alpha = 0.94).

(2) Trait activation was also measured using the scale derived from the factor

analyses reported in Chapter 5. This scale included 8 of the 10 items from the State-

Trait Anger Expression Inventory-2 (STAXI-II; Spielberger, 1999). Within this

study, the scale had high reliability (alpha = 0.83).

(3) Negative thinking styles were again assessed using the Rehearsal subscale

of the most recently revised version of the Emotion Control Questionnaire (ECQ3;

Roger et al., 2011).

(4) The Life Orientation Test–Revised (LOT-R; Scheier et al., 1994) was again

used to evaluate positive thinking styles.

(5) Complex thinking styles were assessed by evaluating students' writing

samples using the stream-of-consciousness procedure (Pennebaker & King, 1999).

Here, students were required to write freely about what was going through their

minds and their current feelings and sensations. The following instructions were used

(Pennebaker & King, 1999; p. 1301):

For this assignment you should think about what your thoughts,

feelings and sensations are at this moment. Write your thoughts as

they come to you. If you prefer you can write your thoughts and

feelings on paper and then type them onto a Word document. Your

goal in this assignment is to reveal in your writing the way your mind

works naturally. The important thing is for you to write continuously

and don't worry about grammar, sentence structure or spelling. Please

write freely for at least 20 minutes.

This procedure was chosen to obtain students' naturalistic use of language as the

words individuals use have been shown to reflect their cognitive processes (Owens &

Wedeking, 2011; Pennebaker & King, 1999; Pennebaker, Mehl & Neiderhoffer,

2003; Slatcher et. al., 2007; Tauczik & Pennebaker, 2010).

Students' streams-of-consciousness were assessed by evaluating the frequency

with which they used certain types of words which researchers describe as reflecting

the complex thoughts that influence adjustment to life experiences (Table 6.1). For

instance, increased use of insight words – representing individuals' attempts at self-

reflection and the search for causes and reasons behind the experience (Table 6.1) –

have been linked to improved levels of functioning among patients with problems of

addiction (Stephenson, Laszlo, Ehmann, Lefever & Lefever, 1997). Students' use of

these words was evaluated using the most recent version of the word-based counting

programme – the Linguistic Inquiry and Word Count (LIWC; Pennebaker et al.,

2001). This revised LIWC assesses how often 72 types of words such as prepositions

and conjunctions have been used in a given text sample. The results state the

percentage of words in the text that belong to each of the 72 categories or scales. The

scales of the LIWC have emerged as reliable across time, topic and text sources

within an analysis of daily diaries of inpatients in an addiction treatment centre, daily

class assignments of summer school students in the United States and published

abstracts of well-known psychologists (mean alpha across all scales = 0.56;

Pennebaker & King, 1999).

To determine the best LIWC scales for assessing complex thinking styles

within this student population, a factor analysis was run using the scales researchers

most commonly describe as indicative of complex thinking – words that reflect

attempts to connect multiple thoughts and ideas (Owens & Wedeking, 2011;

Pennebaker & King, 1999; Slatcher et al., 2007; Tausczik & Pennebaker, 2010). This

was done based on previous similar analyses performed by researchers (Owens &

Wedeking, 2011; Pennebaker & King, 1999). Factor analysis was run on 11 LIWC

scales including words greater than six letters, prepositions, conjunctions, negations

and words indicating cause, cognitive processes, discrepancies, tentativeness,

insightfulness, exclusiveness and inclusiveness. For these analyses, a single factor

model was specified based on the need to derive one main variable to evaluate

complex thinking styles. In addition, a minimum loading exclusion criteria of 0.30

was applied.

Based on the results of the factor analyses (see Appendix I), four of the scales

were used to assess complex thinking styles within this study. These scales included

words indicating insight, cognitive processes, exclusiveness and tentativeness. The

characteristics of each of these scales can be found in Table 6.1. The scores on these

four scales were standardised and combined to form a composite score (Owens &

Wedeking, 2011). The reliability of the composite measure was acceptable (alpha =

0.69).

Table 6.1.

Examples of words and reliabilities for the LIWC scales that were used to assess complex thinking styles in Study 9

LIWC scale	Examples	Description of complex thinking represented by the scale	Binary alphas
Insight words	Think, know, consider	expression of self-reflection and the search for understanding about the true nature of an experience or one's self	0.94
Cognitive processes	Cause, know, ought	general expression of cognitive processing or higher level thinking	0.97
Exclusive words	But, without, exclude	used in discerning the truth by making distinctions between what is in a category and what is not in a category	0.67
Tentatives	Maybe, perhaps, guess	reflects a lack of certainty or clarity of thoughts or understanding	0.87

(5) Resilience was again evaluated with the Connor-Davidson resilience scale as was

used in the previous studies (CD-RISC; Connor & Davidson, 2003).

6.1.1.3.   Procedure

The questionnaires and streams-of-consciousness were all completed online.

The survey began by informing participants about the questions they will be

completing and asking them to give their informed consent by entering their email

address. This entry then allowed them to begin filling in the various measures.

6.1.1.4.   Data analysis

The Kolomogorov-Smirnov test and visual inspection of the histograms

revealed that trait activation, trait inhibition and positive thinking scores violated the

assumption of normality. However, removal of outliers and logarithmic and inverse-

logarithmic transformations failed to remove these skews (Pallant, 2007). Therefore,

as was done in the previous chapters, Spearman's rho was applied to evaluate

correlations and the proposed mediations (in this case moderated mediations) were

evaluated using bootstrapping (5,000 resamples with the bias and accelerated

method).

Moderated mediation analyses were required in order to explore the impact of

complex negative thinking and complex positive thinking on the relationship between

trait activation/trait inhibition and resilience. Specifically, they evaluated:

(1) whether the mediating influence of negative thinking styles on the

relationship between trait activation/trait inhibition and resilience is impacted

(moderated) by students' levels of complex thinking; and

(2) whether the mediating influence of positive thinking styles on the

relationship between trait activation/trait inhibition and resilience is impacted

(moderated) by students' levels of complex thinking

Prior to the moderated mediation analyses, researchers recommend that a

moderation analysis is performed. They assert that for a moderated mediation to

exist, there must be a significant impact of the relationship between the predictor

variable (in this case, negative thinking and positive thinking) and the moderating

variable (in this case, complex thinking) on the dependent variable (in this case,

resilience) (Baron & Kenny, 1986; Criss, Pettit, Bates, Dodge & Lapp, 2002; Wilks,

2008). Therefore, this pre-requisite was evaluated prior to performing the main

analysis. Two moderation analyses were run . The first analysis evaluated the

moderating influence of complex thinking on the relationship between negative

thinking and resilience. The second analysis evaluated the moderating influence of

complex thinking on the relationship between positive thinking and resilience. The

two moderation analyses are depicted in Table 6.2. Control variables were used based

on previous research (see Table 6.2).

This moderation was performed using Hayes and Matthes' (2009) programme

developed to facilitate the running of moderation analyses within SPSS (Muller, Judd

Table 6.2.

The moderation analyses being performed in Study 9

Moderation analysis	Predictor variable	Moderator variables	Dependent variable	Control variables
(1)	Negative thinking	Complex thinking	Resilience	Positive thinking
(2)	Positive thinking	Complex thinking	Resilience	Negative thinking

& Yzerbyt., 2005; Preacher et al., 2007; Ng, Ang & Chan, 2008; Wiedemann, Schüz,

Sniehotta, Scholz & Schwarzer, 2009). This programme was chosen for several

reasons. Primarily, it facilitated the implementation of the bootstrapping method

which was necessary given the skewness of the current data set. It also allowed

differentiation of the principal predictor from the moderator variable. Therefore, it

was possible to label complex thinking as the proposed moderator for both models;

negative thinking as the principal predictor variable for the first analysis and positive

thinking as the principal predictor variable for the second analysis. The programme

also enabled control of the influence of additional variables not being assessed within

that particular analysis, leading to a more efficient analysis. For instance, when

evaluating the interaction between complex thinking and positive thinking, the

influence of negative thinking was able to be controlled and when evaluating the

interaction between complex thinking and negative thinking, the influence of positive

thinking was able to be controlled.

Lastly, a key part of moderation is that the relationship between the predictor

and the outcome variable changes for different values of the moderator variable. This

programme allowed assessment of how the relationship between negative/positive

thinking and resilience changes for values of complex thinking one standard

deviation above and below the mean. Therefore, it enabled the moderating impact of

complex thinking to be fully evaluated.
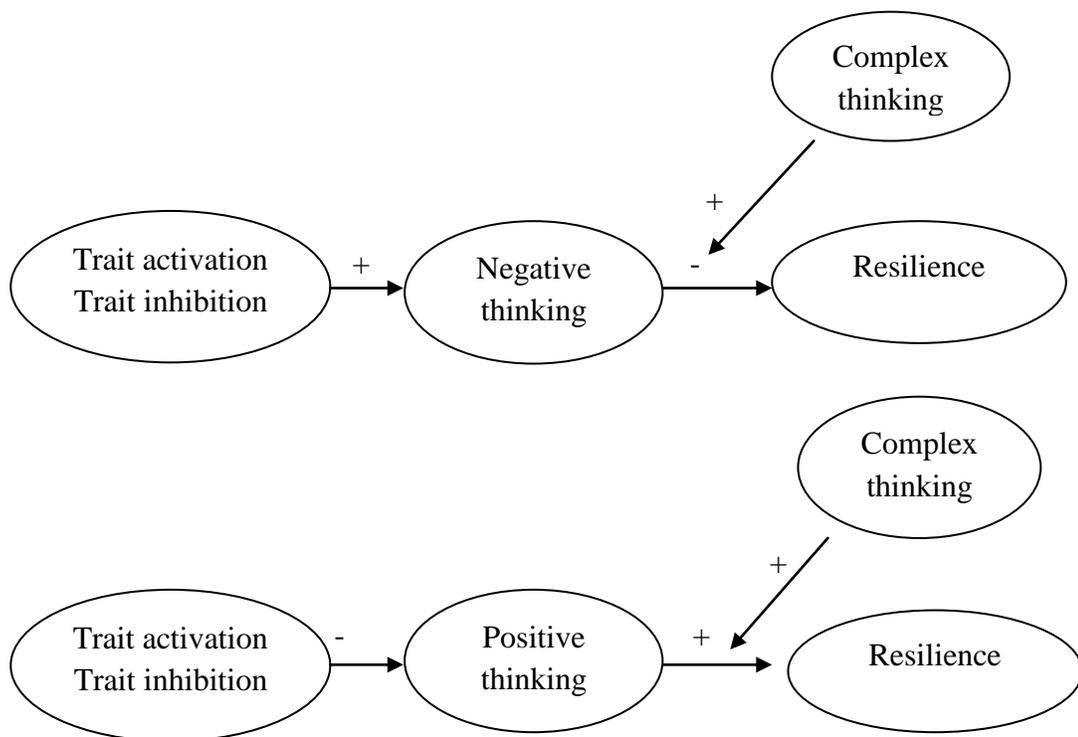
Figure 6.2. Graphic representation of the moderated mediation models being

evaluated in Study 9.

6.1.2. Results

6.1.2.1.   Descriptive statistics

Means, standard deviations and ranges are presented in Table 6.3. For the
negative thinking, positive thinking and resilience measures, the means remained
generally comparable to prior research in similar undergraduate populations (Bitsika
et al., 2010; Burris et al., 2010; Chang et al., 2000; Culhane & Morera, 2010; Litman
et al., 2005; Roger & Najarian, 1989; Spielberger, 1999; Spielberger et al., 1983,
Spielberger, 1995). As complex thinking, trait activation and trait inhibition were
created specifically for this analysis using standardised scores, their means could not
be compared to other studies.

6.1.2.2.   Preliminary analyses

Based on small and unequal sample sizes, Mann-Whitney U and Kruskall-
Wallis tests were used to explore the influence of gender and ethnicity respectively
(see Appendix J). No significant gender differences were found. However, several
ethnic differences emerged for scores on the resilience measure. Non-UK Europeans
had significantly higher levels of resilience compared to White British students,
$H(5)=75.56$, p=.041, and Asian British students, $H(5)=35.50$, p=.040. Therefore, for
the main analyses, ethnicity was entered as a control variable.

Table 6.3.

Means, standard deviations and ranges for trait activation, trait inhibition, the

mediators and resilience

Variable	Mean	Std. deviation	Range
Trait activation	13.94	4.15	8.00 - 31.00
Trait inhibition[a]	0.00	1.73	-3.21 – 5.42
Negative thinking	7.55	4.28	0.00 – 17.00
Positive thinking	20.85	4.93	6.00 – 30.00
Complex thinking[a]	0.00	2.92	-5.45 – 13.08
Resilience	61.12	11.10	28.00 – 87.00

Note [a] Variables were created using standardised scores and thus have a mean of 0

6.1.2.3.   Correlations

Table 6.4 shows the correlations between the trait activation and trait inhibition

variables, the mediators (see Figure 6.1) – complex positive thinking and complex

negative thinking – and the resilience measure. To develop the mediators, complex

thinking, positive thinking and negative thinking scores were centred and then their

interaction terms were computed.

The majority of the correlations emerged as anticipated except for the

correlations involving trait activation and the interaction terms – complex positive

thinking and complex negative thinking. Firstly, as hypothesised, trait activation was

negatively related to complex positive thinking; however, contrary to the hypothesis,
trait activation was also negatively correlated with complex negative thinking.
Furthermore, both these relationships were not significant. In addition, trait activation
was not significantly related to resilience. As a significant relationship between
predictor and outcome variables is considered necessary for mediation (and by
extension moderated mediation) analyses (Baron & Kenny, 1986; Criss et al., 2002;
Wilks, 2008), the moderation assessments were not performed for trait activation.

The correlations involving the interaction terms also showed that both complex
negative thinking and complex positive thinking were negatively related to students'
resilience, contradicting the hypotheses. However, only positive complex thinking
exerted a significant negative impact. This contrasted with the significantly positive
relationship between positive thinking and resilience that emerged in Chapter 3. The
difference in these correlations suggested that the complex positive thinking may
exert a distinct influence on students' levels of resilience compared to positive
thinking, but this may not be the case with complex negative thinking and resilience
compared to negative thinking and resilience. This was clarified through a
moderation analysis.

Table 6.4.

Spearman's correlations between trait activation, trait inhibition, the mediators and

resilience

Variable	1	2	3	4	5
(1) Trait activation		0.19*	-0.06	-0.03	-0.09
(2) Trait inhibition			0.00	0.19*	-0.59***
(3) Complex thinking*negative thinking styles				-0.11	-0.02
(4) Complex thinking*positive thinking styles					-0.18*
(5) Resilience					

Notes: ***p <.001, *p <.05.

6.1.2.4.   *Moderation analyses*

Two moderation analyses were performed. For the first analysis (moderation

analysis 1 in Table 6.2), resilience was the dependent variable; ethnicity and positive

thinking were inserted as control variables; the principal predictor was negative

thinking styles and complex thinking was the moderator variable. This analysis

evaluated the moderating impact of complex thinking on the relationship between

negative thinking and resilience: it assessed the relationship between complex

negative thinking and resilience.

For the second analysis (moderation analysis 2 in Table 6.2), resilience was the

dependent variable; ethnicity and negative thinking were inserted as control

variables; the principal predictor was positive thinking styles and complex thinking

was the moderator variable. This analysis evaluated the moderating impact of

complex thinking on the relationship between positive thinking and resilience: it

assessed the relationship between complex positive thinking and resilience.

Within both analyses, the interaction term did not exert a significant impact on

resilience, $p=.574$ and $p=.103$ respectively. These results showed that complex

thinking did not interact with positive and negative thinking to exert an impact on

students' levels of resilience, that is, that complex positive thinking and complex

negative thinking did not influence students' levels of resilience. Therefore, the

moderated mediation was not performed.

6.1.3. Discussion and Conclusions

Chapter 4 revealed that negative trait emotion comprised two main traits - trait

activation and trait inhibition. This study examined the mediating impact of complex

negative thinking and complex positive thinking styles on the relationship between

trait activation and resilience and trait inhibition and resilience.

The results showed that trait activation was not significantly correlated with

resilience. This contradicts the hypotheses concerning the relationship between trait

activation and resilience. Instead it suggests that trait activation – the predisposition

toward oversensitivity to rewards in the environment and the propulsion to seek these

rewards despite potential danger – may not exert a significant negative influence on

student adjustment to university life.

These findings seem to oppose the previous significant correlations that

emerged within Chapters 3 and 4. It can be argued that this may be due to the fact

that trait activation was evaluated with only 8 of the 10 items used to evaluate

students' levels of trait anger. However, evidence suggests that trait anger similarly

may not exert a major influence on students' levels of resilience. The correlations

within these two Chapters revealed that trait anger was only modestly related to

resilience ($p < .05$). Furthermore, the correlation co-efficients were small: in Chapter

3, the correlation co-efficient was -0.21 and in Chapter 4, the correlation co-efficient

was   -0.15. Researchers assert that correlations below 0.3 may signal a weak

relationship depending on the size of the sample used within the analysis (Field,

2013; Gastonis & Sampson, 1989). According to Gastonis and Sampson (1989), this

meant that within the current analysis the power of these correlation analyses was

relatively low (power > 0.8). As such, the fact that trait activation failed to emerge as

significantly related to resilience within the current study is not surprising.

However, in Chapter 3 it was argued that although trait anger was only weakly

related to resilience, this was an important relationship. This was based on the

findings of Study 2 where rumination was found to fully mediate the modest

relationship between trait anger and resilience. These results corroborated the

significant impact of negative thinking styles on resilience put forth by Davey et. al

(2005), as discussed in Chapter 3. Therefore, the absence of even a weakly significant

relationship in the current study seems to contradict these prior arguments concerning
the influence of trait anger on student adjustment through negative thinking styles.

Alternatively, the absence of a significant relationship between trait activation
and resilience could be attributed to the use of trait inhibition and trait activation
rather than trait anger, trait anxiety and trait depression. Within the current study,
items from the trait anger scale were used to assess trait activation while items from
the trait anxiety and trait depression scales were combined to form a composite score
for trait inhibition. Prior correlations within Chapters 3 and 4 which examined trait
anger, trait anxiety and trait depression separately revealed that trait anger was
significantly highly correlated with trait anxiety and trait depression. Therefore, the
relationship between trait anger and resilience may have been caused by the stronger
relationship between trait anxiety and resilience or between trait depression and
resilience.

To evaluate this, these correlations were re-run using the partial correlation
procedure. Two partial correlations were performed. The first analysis used the
sample from Chapter 3 (Studies 1 and 2) while the second analysis used the sample
from Chapters 3 and 4 (Studies 3 – 6). For each partial correlation, the relationship
between trait anger and resilience was evaluated controlling for the influence of trait
anxiety and trait depression. The results supported the latter argument. Within both
analyses, when the impact of trait anxiety and trait depression was controlled, the
relationship between trait anger and resilience was no longer significant (all ps > .05).
Based on these findings, it can be concluded that high levels of trait anger/trait

activation may not significantly influence students' difficulty in developing higher

levels of resilience through a habitual tendency to engage in negative thinking.

This aligns with research involving the behavioural activation (BAS) and

behavioural inhibition (BIS) systems (Gray, 1991; Pennebaker, 1985). For instance,

Pennebaker (1985) argued that the BIS involved actively inhibiting behaviour

(behavioural inhibition) as well as inhibiting thoughts and feelings concerning life

experiences (cognitive inhibition). He related this behavioural and cognitive

inhibition to poor adjustment following adverse life events, suggesting a link to lower

levels of resilience. This supports the correlations that emerged in the present study.

In addition, the BAS has been linked to a focus on cues of reward (cognitive

activation) which causes individuals high on trait BAS to "overrespond" – respond

impulsively – to various stimuli (behavioural activation) (Matthys, van Goozen, de

Vries, Cohen-Kettenis & van Engeland, 1998, p. 644). Such impulsivity is not

strongly related to resilience (Rutter, 2007; Wilkowski & Robinson, 2008),

supporting the current results. Therefore, since the relationship between trait

activation and resilience is not significant, the impact of trait activation on student

adjustment will not be assessed in the remainder of the thesis.

Within the current study, the moderation analyses revealed that complex

positive thinking styles and complex negative thinking styles did not significantly

influence resilience. These results contradicted the hypotheses, refuting previous

studies into student adjustment (Jackson et al., 2000; Pancer et al., 2000). However,

this may have been due to the fact that unlike prior investigations into the influence

of complex thinking on student adjustment, this study aimed to examine the impact

of a more pervasive form of complex thinking, not one that is focused on students'

expectations of their university experience as was done in these investigations. The

results thus suggest that this more pervasive form of complex thinking may not

influence the difficulties students may have in adjusting to university. Instead as was

found in Chapters 3 and 4, students' lower levels of resilience may be attributable to

their tendency to habitually engage in: (1) increased negative thinking and (2)

reduced positive thinking.

Chapter 1 asserted that these thinking styles influenced students' levels of

resilience by impacting whether or not they are able to find meaning. However, the

proposed two-stage meaning making process was not derived from studies into

student adjustment. Therefore, the next chapter will explore how students make

meaning of their university experiences and the impact of this meaning on their levels

of resilience in order to determine whether students adjusted to university by

searching for and discovered both meaning as comprehensibility and meaning as

significance.

Chapter 7 An exploration of the influence of meaning as comprehensibility and meaning as significance

This Chapter explores the influence of finding meaning on student adjustment to university. As discussed in Chapter 1, finding meaning has been highlighted by many researchers as the main cognitive process which generates adjustment to various life experiences (Davis et al., 1998; Davis & Morgan, 2008; Holland et al., 2006; Janoff-Bulman & Frantz, 1997; Pakenham et al., 2004; Schok et al., 2010; Updegraff et al., 2008). These studies suggest that persons can find meaning in one of two ways: (1) meaning as comprehensibility and (2) meaning as significance (Davis et al., 1998; Holland et al., 2006; Michael & Snyder, 2005).

Meaning as comprehensibility, also referred to as "making sense" of the event, involves "creating a cognitive framework to explain the experience" (Schok et al., 2010, p. 331). According to Janoff-Bulman and Frantz (1997), meaning as comprehensibility involves fitting the event into one's existing personal construct system (schemas). For them, this involves a consideration of the extent to which the event goes against the belief that one's life is controllable, just and non-random. For instance, they claim that some individuals find meaning as comprehensibility when they are able to make sense of the experience in terms of having "deserved" its occurrence or that "justice" had prevailed. These researchers argue that meaning as comprehensibility promotes adjustment because it enables individuals to maintain their schema system and thus makes it possible that they can predict and interact with the environment (Janoff-Bulman & Frantz, 1997).

Davis et al., (1998) and Pakenham et al. (2004) both substantiated these

arguments. In their evaluation of 205 American individuals dealing with the death of

a hospice-residing family member, Davis et al. found that meaning as

comprehensibility involved developing an understanding of the predictability of the

loss with explanations such as "It always made sense to me. I mean he smoked for

years. It's perfectly sensible to me". This epitomizes the "fitting into existing

schema" that was described by Janoff-Bulman and Frantz (1997). Similarly, among

47 parents of children with Asberger's syndrome (ASD) in the United States,

Pakenham et al. found an emphasis on having an understanding of the experience that

aligned with their schemas. This was seen in statements such as "It can't be changed/

can't be helped". Both studies found high interrater reliability for this category (all

alphas > 0.85), adding credibility to their findings. They also found significant

relationships between meaning as comprehensibility and adjustment within their

populations.

Meaning as significance, also referred to as "finding benefit" in the experience,

involves determining how the experience has brought worth or value to one's life

(Schok et al., 2010). Contrary to meaning as comprehensibility, meaning as

significance does not consider how the experience fits in to existing schema but

rather focuses on minimizing or mitigating the negative implications of the event by

emphasizing its positive impact on one's life (Davis et al., 1998). According to

researchers, finding such benefit in one's experiences promotes adjustment because it

"preserves or restores the notion that one's own life has purpose, value, and worth"

(Davis et al., 1998, p. 562). They argue that it is this ability to maintain the belief in

life as having a purpose that promotes adjustment.

Support for these arguments also emerged within Davis et al.'s content

analysis. The results showed that participants found meaning as significance by

focusing on finding the "silver lining" (Davis et al., 1998, p. 561) with explanations

highlighting a growth in character, gaining perspective or a new appreciation for

family relationships (Davis et al., 1998). Similarly, in Pakenham et al.'s content

analysis, they also discovered that parents reported finding various benefits in

parenthood such as increased understanding and tolerance. Both studies found high

interrater reliability for this category (all alphas >0.87), adding to the credibility of

their findings. In addition, they both found significant relationships between meaning

as significance and adjustment within their populations.

Prior results also suggested that the impact of both these types of meaning on

adjustment may vary. For instance, as previously discussed in Chapter 1, Davis et al.

(1998) linked finding both types of meaning to lower levels of distress at 6 months

post-bereavement among their participants dealing with the death of a hospice-

residing family member. However, at 13 months and 18 months post-loss, these

researchers found that only discovering meaning as significance continued to have a

significant impact. Conversely among college students dealing with bereavement,

Holland et al. (2006) found that both forms of meaning exerted an impact on student

adjustment. This suggests that the impact of finding meaning may vary based on the

population being evaluated and highlights the need for the current investigation into

the impact of finding meaning as comprehensibility and meaning as significance on student adjustment to university life.

This chapter performs its analysis in two studies. Study 10 has two main aims: (1) to explore whether meaning as comprehensibility and meaning as significance represent two distinguishable construals of meaning and (2) to examine whether the different ways in which students find meaning as comprehensibility and meaning as significance exert independent effects on their adjustment. Study 11 subsequently examines: (i) whether these two forms of meaning differ in their influence on the levels of resilience of first-year students and (ii) whether these differences persist throughout students' university careers.

7.1.   Study 10: Exploring both forms of meaning and their relationship to resilience

Previous studies have sought to distinguish between finding meaning as comprehensibility and finding meaning as significance in two main ways: (1) investigations into how these different ways of finding meaning are related to each other (Davis et al., 1998; Pakenham et al., 2004) and (2) content analyses to determine the various ways in which individuals find meaning as comprehensibility and meaning as significance and how these various ways influence adjustment (Davis et al., 1998; Pakenham et al., 2004).

For instance, Pakenham et al. (2004) evaluated the relationship between meaning as comprehensibility and meaning as significance by assessing the

magnitude and significance of the correlations between the two forms of meaning. The investigators claimed that significant correlations signalled conceptual similarities, hinting that both forms of meaning are part of the same meaning making process. However, if the correlation coefficient is also low in magnitude, this further suggests that the two forms of meaning are measuring different things. Therefore, for them, coefficients which are significant but low to moderate in magnitude support the postulations that the two forms of meaning are assessing distinct aspects of the same meaning making process.

In line with these suggestions, Pakenham et al. (2004) found that among the parents within their sample the correlation coefficient between finding meaning as comprehensibility and finding meaning as significance was low ($r = .40$) but significant ($p < .01$). According to the researchers, these findings suggested that although conceptual similarities were present, the two forms of meaning were not identical in nature. As a result, they concluded that the two forms of meaning were distinct parts of the same meaning making process which meant that "parents who made meaning via one pathway are also likely to find meaning via the other" (p. 257). In support of this, they found that 64% of their sample reported finding both forms of meaning. These results substantiated their postulations that meaning as comprehensibility and meaning as significance represent the two distinguishable ways in which individuals find meaning in their experiences.

This has been further supported by content analyses. Content analysis is the most frequently used method of exploring whether meaning as comprehensibility and

meaning as significance represent two distinguishable forms of meaning. Through

content analyses, Davis et al. (1998) and Pakenham et al. (2004) found that questions

used to assess these meanings generated a variety of responses, indicating that

individuals may find meaning as comprehensibility and meaning as significance in

many different ways. However, the different types of meaning as comprehensibility

were distinct from the different types of meaning as significance, supporting the

independence of the two forms of meaning.

For instance, Davis et al. evaluated meaning as comprehensibility by asking

their participants: "Do you feel you have been able to make sense of the death?" and

meaning as significance with the question: "Sometimes people who lose a loved one

find some positive aspect in the experience. For example, some people feel they learn

something about themselves or others. Have you found anything positive in this

experience?". Both these questions elicited different types of responses from

participants. In response to the first question, one participant stated "My basic

attitude to life was that there's a beginning and an end, and it's going to happen to

one or the other of us sooner or later, and you have to cope with it. That's all. There's

nothing you can do to prevent these things from happening. They're a part of life"

while another stated "I think that my father's illness was meant to be, and that was

God's plan. He lived a really long life, and everybody has their way to go from this

world, and that was his way..." On the other hand, in response to the second question,

one of the participants responded as follows: "We definitely learned a lot about

ourselves and about each other within the family circle. There was a rallying of

support, and a camaraderie that I think only shows itself...when something like this happens" and "It was an end to her suffering".

The researchers asserted that, as shown in the examples quoted, there was very little overlap in the responses elicited for the two questions. For them, this indicated that the meaning as comprehensibility and meaning as significance represented two distinguishable types of meaning. This was further supported by high interrater reliability: 0.85 at 6-months and 0.87 at 13-months post-loss for meaning as comprehensibility and 0.90 and 0.87 at 6-months and 13-months post-loss respectively for meaning as significance. These alphas also suggested that clear distinctions existed between the various types of meaning that participants described. Therefore, content analyses also support the postulations that individuals can find meaning in their experiences in two distinguishable ways (meaning as comprehensibility and meaning as significance).

In addition, the content analyses reveal that both types of meaning can take various forms. However, research has shown that these various categories may not uniquely influence adjustment. For instance, in Davis et al.'s (1998) study of individuals dealing with the death of a hospice-residing family member, they found that adjustment was not differentially impacted by the types of meaning as comprehensibility or meaning as significance that their participants had found. Within the study, adjustment was evaluated using three measures: (1) the Inventory to Diagnose Depression (IDD; Zimmerman & Coryell, 1987), (2) the positively valenced items of the state version of the State-Trait Anxiety Inventory (Spielberger,

Gorsuch & Lushene, 1970) and (3) a measure of Post-Traumatic Stress Disorder

(PTSD) symptomatology developed from the items of PTSD symptoms within the

Diagnostic and Statistical Manual (3rd ed., rev.; *DSM–III–R*; American Psychiatric

Association, 1987). All the measures had high alphas ranging from 0.75 to 0.93,

increasing the confidence that can be placed in the findings. Standardised scores on

the three measures were summed to create a composite score of participants' distress.

This was done based on the results of a principal components analysis which revealed

a single underlying factor accounting for 70 percent of the variance in scores on the

three measures.

The researchers regressed adjustment scores (at 6-months) on several dummy

variables (created using discovering meaning [comprehensibility/significance] and

each of the related categories). This evaluated whether participants who had derived

any of the categories of meaning underlying meaning as comprehensibility and

meaning as significance were more likely to adjust better to the loss. The analyses

revealed that none of the categories were more strongly related to adjustment than

any of the others and did not explain a significantly increased amount of variance in

participants' adjustment scores. They concluded that although both meaning as

comprehensibility and meaning as significance are associated with various unique

explanations, the specific type of meaning as comprehensibility and meaning as

significance that participants had derived did not influence how they adjusted to the

bereavement. Instead it was more important whether or not they had found meaning

as comprehensibility or meaning as significance in the loss at all. This substantiated

the importance of exploring the impact of these the two distinct forms of meaning on

adjustment.

The current study sought to determine whether: (1) students make meaning of

their university lives in two distinct ways and (2) these two forms of meaning or their

sub-categories exerted a more significant influence on how students adjusted to

university life. It was hypothesised that meaning as comprehensibility and meaning

as significance would represent two distinguishable construals of meaning with the

most significant influence on students' resilience. This would be illustrated by: (i)

two forms of meaning that are not highly correlated with each other, (ii) content

analyses of meaning as comprehensibility that produce different categories than the

content analyses of meaning as significance and (iii) categories derived from these

content analyses which: (a) are not differentially related to resilience and (b) do not

exert a more significant impact on students' levels of resilience than whether or not

they found meaning as comprehensibility and/or meaning as significance at all.

7.1.1. Method

7.1.1.1.   Participants

Data were obtained from 390 students of the University of York (149 males

and 241 females) within the first 3 weeks of Term 1 of the 2013/2014 academic year.

The sample was collected using online and poster advertising around the University

of York campus. Participants received a small financial reward or course credit in

return for participation. The mean age of the sample was 20.85 years (Range= 18 -

24). The sample included White British (66.15 %), non-UK European (12.30%),

Asian (2.6%), Chinese (14.10%), African/Caribbean (1.50%), Black British (0.50%)

and Asian British (2.6%) students.

7.1.1.2.   Materials and apparatus

(1) Multiple methods have been employed to evaluate how individuals make

meaning of their experiences, mainly single-item open-ended questions (Davis et al.,

1998; Pakenham et al., 2004). However, researchers claim that these single-item

questions may fail to accurately reflect how individuals make meaning of their

experiences (Davis & Morgan, 2008). According to Singer (2004), these meanings

become the "building blocks" of individuals' identity: they "yield a life story schema

that provides causal, temporal, and thematic coherence to an overall sense of

identity" (p. 442). He thus suggests that meaning is most effectively assessed by

allowing individuals to write openly on the content of this "life story schema", what

he termed their "narratives".

In line with his arguments, researchers have used individuals' "narratives"

about their experiences to explore meaning making. For instance, King and Raspin

(2004) used the narrative procedure to evaluate how women (divorced for an average

of 22 years) had made meaning of their divorce and how this related to their well-

being. The researchers asked their participants to describe their "best possible selves"

before the divorce and at the present time (after the divorce). To evaluate the

meanings that were made, they examined the narratives in terms of: (1) participants'

ratings of salience – the frequency with which they thought about these "best possible

selves" and (2) the degree of elaboration – the level of imagery, vividness and detail present in each narrative.

In similar trend, within this study, meaning making was assessed by evaluating students' narratives obtained using the streams-of-consciousness procedure (Pennebaker & King, 1999). Here, students were required to write freely about their university lives using the following instructions adapted from Pennebaker and King (1999, p. 1301-1302):

> Express in your writing what it has been like for you coming to
> university, and explore your thoughts and feelings of being in
> university in general. How does this relate to other aspects of your
> life? For example, how does being in university relate to your
> childhood, your relationships with family, friends, etc.? How does
> it relate to who you are, who you have been in the past, and who
> you want to be in the future? The goal of this assignment is to
> explore the psychological experience of being in university. It is
> important for you to write continuously and don't worry about
> grammar, sentence structure or spelling. Please write freely for at
> least 20 minutes.

This method was chosen because it provided the narratives described by Singer (2004) as giving the most insight into participants' meanings. Furthermore, it has been described as ideal for performing fine-grained analyses of the content of individuals' thoughts. For instance, Molina et al. (1998) used this procedure to

explore the temporal, affective and attentional/cognitive features of participants'

worrisome thinking patterns. It was therefore considered the most suitable method for

the intended analyses of the content of the meaning students made of their university

lives.

(2) Resilience was again evaluated using the Connor-Davidson Resilience

Scale (CD-RISC; Connor & Davidson, 2003) as was done in previous studies.

7.1.1.3.   *Procedure*

The measures were all completed online as part of a battery of measures, the

remainder of which is reported in remaining studies within this and the following

Chapter. The survey began by informing participants about the questions that they

would be completing and asking them to give their informed consent by entering

their email addresses. This entry then allowed them to begin filling in the various

measures.

7.1.1.4.   *Data analysis*

Analyses included: (1) correlations which evaluated the relationship between

meaning as comprehensibility and meaning as significance, (2) content analyses

which explored the various ways in which students found meaning in their university

lives and (3) correlations which examined the relationship between these various

ways of finding meaning and resilience and compared these to the correlations

between: (i) finding meaning as comprehensibility and resilience and (ii) finding

meaning as significance and resilience. Similar to prior empirical work, as the current study was aimed at determining whether the proposed model of finding meaning – finding meaning as comprehensibility and finding meaning as significance – is applicable to the undergraduate student population, the impact of demographic variables on finding meaning were not explored (Davis et. al., 1998; Pakenham, 2004).

For the first set of analyses, students' streams-of-consciousness were coded in two ways. Primarily, six independent coders categorised the streams-of-consciousness as either "yes", "no" or "partly" for each of the two forms of meaning. There were thus two "yes" categories, two "no" categories and two "partly" categories. If there was evidence that students had discovered either meaning as comprehensibility or meaning as significance, their narratives were placed in the "yes" category associated with the specific form of meaning; if there was no such evidence, their narratives were placed in the associated "no" category.

On the one hand, responses which indicated that students had discovered meaning as comprehensibility showed that they had made sense of their university lives by relating it to some existing belief. For instance, one student wrote:

I treated any bad memories and experiences, such as my food being eaten away or stolen, as specific to living with a large number of people, people who remained anonymous to me for the most part.

This response showed that he/she made sense of the university experience of his/ her "food being eaten away or stolen" by relating it to his/her having to live with numerous other students. On the other hand, responses which indicated that students had discovered meaning as significance showed that they had found some benefit in their university lives. For instance, one student wrote:

> I enjoy York university life and I feel enriched by my experience
>
> here - there is always something to do and something to learn
>
> and this makes me happy.

This student cites several benefits to being at university including increased opportunities for activity and for learning.

If evidence was found that the student was still engaged in the search for either meaning as comprehensibility or meaning as significance, the narrative was placed into the "partly" category associated with the specific form of meaning. Responses which indicated that students were still engaged in the either of the two searches for meaning included statements of uncertainty which suggested that such meaning was still being processed. For example, a statement illustrating the search for meaning as comprehensibility is given below:

> Although sometimes I think about if I am who I am here – or am
>
> I just putting on some massive charade, it's all a bit odd this self
>
> exploration thing is great and all but can leave you feeling a bit
>
> lost and confused about who you are in the first place. I don't

even know who I am so how can I be sure if the person I'm

portraying to people is the real me. I don't know it's all very

confusing.

The student shows uncertainty when he/she talks of being "lost" and "confused" in

terms of being true to who he/she is – whoever that may be. He/she is trying to fit

their social experiences at university into the existing schema of how they see

themselves.

Interrater reliability for these four stages of meaning (search for meaning as

comprehensibility/ meaning as significance and discover meaning as

comprehensibility/ meaning as significance) was calculated using Fleiss' Kappa

(Fleiss, 1971). Fleiss' Kappa is an extension of Cohen's (1960) kappa developed for

use in cases where inter-rater reliability is to be calculated from multiple raters and

weighting is not essential (Fleiss, Cohen & Everitt, 1969). It was chosen for this

study as six raters had been used and the assessments involved a binary scale (yes/no)

rendering weighting unnecessary. The Kappas obtained suggested acceptable

agreement existed among raters for each category: 0.70 for searching for

comprehensibility, 0.71 for discovering comprehensibility, 0.72 for searching for

significance and 0.71 for discovering significance.

Disagreements were negotiated by reviewing the coding scheme in relation to

the specific script. In most cases, these were resolved by going with the majority (if

three or more of the six raters agreed) and in the absence of a majority, by the main

researcher. Test-retest correlations were also computed for these four meaning

making categories (Davis et al., 1998). This was done using data collected from 148

of the first-year undergraduates in terms 1 and 2 (see Section 7.2.1.1). For all four

variables, the correlations indicated the presence of good reliability (rs ranged from

0.57 to 0.63; all ps <.001). These results supported the accuracy of the categorisation

of students' narratives into the four stages of meaning.

The content analyses involved grouping students' streams-of-consciousness

according to the types of meaning as comprehensibility and meaning as significance

that they had discovered. Although the various explanations given were considered

mutually exclusive, students who gave multiple explanations were placed into more

than one category. Six coders again categorised the data. Disagreements were

similarly negotiated by reviewing the coding scheme in relation to the specific script.

In most cases, these were resolved by going with the majority (if three or more of the

six raters agreed) and in the absence of a majority, by the main researcher. Here,

Fleiss' kappa was also used to determine the degree of interrater agreement for the

allocation of responses to the categories (Fleiss et al., 1969). The Kappas suggested

good agreement among raters for all categories – meaning as comprehensibility: 0.82

and meaning as significance: 0.84. These findings supported the accuracy of the

grouping of the various explanations.

The final analyses incorporated Spearman's correlations to: (1) evaluate the

relationship between each category of meaning as comprehensibility/ significance

and students' levels of resilience and (2) compare these correlations to the

correlations between meaning as comprehensibility and resilience and meaning as

significance and resilience. This was done to determine whether any of these

categories had a greater influence on student adjustment. Spearman's correlations are

reported due to the dichotomous nature of the variables.

7.1.2. Results

7.1.2.1.   The relationship among the meaning making categories

Table 7.1 presents Spearman's correlations for the four meaning making

categories. The correlation between the search for meaning as comprehensibility and

the discovery of meaning as comprehensibility was both significant and high in

magnitude. This also emerged for the correlation between the search for meaning as

significance and the discovery of meaning as significance. These results supported

the proposed conceptual similarities between each of the two pairs of meaning

making variables (Pakenham et al., 2004).

In addition, although the correlation between the search for meaning as

comprehensibility and the search for meaning as significance was significant, it was

low in magnitude. This was also found for the correlation between the discovery of

meaning as comprehensibility and the discovery of meaning as significance. The low

correlations hint at discriminant validity (Pakenham et al., 2004).

Therefore, collectively, the findings imply that that the four categories

evaluated are distinct but belong to the same meaning making process. This means

that students who search for and discover meaning as comprehensibility are also

likely to search for and discover meaning as significance. In support of this, 37% of

students had discovered both forms of meaning.

Table 7.1

Correlations between the four meaning making stages

Meaning making variable	1	2	3	4
(1) Search for meaning as comprehensibility		0.41*	-0.64**	-0.43*
(2) Search for meaning as significance			-0.44*	-0.64**
(3) Discovering meaning as comprehensibility				0.44*
(4) Discovering meaning as significance				

7.1.2.2.   The various categories of finding meaning and their relationship to students' levels of resilience

The raters found 11 themes underlying meaning as comprehensibility and nine

themes underlying meaning as significance. These categories were comparable to

those described in previous studies (Davis et al., 1998; Pakenham et al., 2004).

Furthermore, in line with prior findings (Davis et al., 1998; Pakenham et al., 2004),

both forms of meaning were associated with different categories. This indicated that

students can discover meaning of their university lives in two distinct ways: (1)

meaning as comprehensibility and (2) meaning as significance.

Appendix K provides a list of the 11 themes for meaning as comprehensibility

and sample responses given by students for each of these. The most frequently

reported theme was experiencing personal growth (n=170). Almost half of the sample

reported that university had helped them to develop important traits such as

assertiveness (n=65), tolerance (n=43) and patience (n=30). Appendix L summarizes

the nine benefit-finding themes and samples of responses given by students for each

of these. The most frequently reported theme was developing skills (n= 142). Almost

two fifths of the sample reflected on engaging in extra-curricular activities (n= 64)

and improving their course knowledge (n=69) and social skills (n=63).

Spearman's correlations were performed to evaluate whether student adjustment was

more significantly related to any of these 20 categories of meaning: the 11 meaning

as comprehensibility categories (see Appendix K) and the nine meaning as

significance categories (see Appendix L) (Pakenham et al., 2004). Table 7.2 presents

these correlations. The 20 categories were all significantly positively related to

resilience and the correlation coefficients suggested that neither category was

significantly more strongly related to students' resilience than another (range = 0.50 –

0.64, all ps <.01). However, more significant relationships existed between meaning

as comprehensibility and resilience, ($r = 0.74$, p <.001) and meaning as significance

and resilience ($r = 0.79$, p <.001). These results suggested that in spite of students

being able to find meaning in their university lives in various ways, how they

adjusted to university was more strongly influenced by whether or not they had found

meaning at all.

Table 7.2

Correlations between the categories of meaning as comprehensibility/ significance

and resilience

	Meaning making category	Resilience scores
Meaning as comprehensibility	Life lessons	0.60**
	Entitlement	0.55**
	Experienced personal growth	0.63**
	Deeper self-awareness	0.55**
	Understanding university life	0.52**
	Focus on relationships	0.60**
	Expected it/prepared for it	0.63**
	Similarity between yourself and others	0.52**
	Coming to terms with responsibility	0.61**
	Hope	0.51**
	Spirituality/faith	0.51**
Meaning as significance	Cultural exposure	0.53**
	Developing skills	0.63**
	Networking opportunities	0.61**
	Positive change in priorities/goals	0.64**
	University and the future	0.62**
	Others will benefit	0.51**
	Strengthening family relationships/friendships	0.63**
	Positive personality change/growth	0.63**
	Increased personal fortitude	0.61**

7.1.3. Discussion and Conclusions

This study evaluated whether students found meaning in their university lives in
two distinguishable ways (meaning as comprehensibility and meaning as
significance). It performed its investigations in a series of analyses which explored:
(1) the relationship between the search for and discovery of meaning and (2) the
various ways in which students can find meaning in their university lives and (3)
whether these various ways of finding meaning are more significantly related to
students' levels of resilience than whether or not they found meaning as
comprehensibility/significance at all. It was hypothesised that meaning as
comprehensibility and meaning as significance represented distinguishable construals
of meaning which would exert the most significant influence on students' levels of
resilience.

The first analysis supported the presence of two distinct forms of meaning,
confirming the hypothesis. Within this assessment, meaning making was evaluated
by categorising students' narratives according to whether they were still searching for
meaning as comprehensibility/ meaning as significance or had discovered meaning as
comprehensibility/ meaning as significance. The correlations between each of these
categories suggested that they represented different aspects of the same overarching
variable – the meaning making process. This meant that, similar to individuals within
populations adjusting to other experiences (Davis et al., 1998; Holland et al., 2006;
Pakenham et al., 2004; Schok et al., 2010), students make meaning of their university

lives in two distinguishable ways: (1) meaning as comprehensibility and (2) meaning
as significance.

This was further corroborated by the content analyses which explored the
various ways in which students discover meaning as comprehensibility/meaning as
significance in being at university. Eleven meaning as comprehensibility themes were
found including gaining a deeper self-awareness and experiencing personal growth.
Similar themes have emerged in content analyses of meaning as comprehensibility
among a population dealing with bereavement (Davis et al., 1998) and parents of
children with Asperger's syndrome (Pakenham et al., 2004). The analyses also found
nine themes for discovering meaning as significance. These included exposure to new
opportunities and increased personal fortitude. This variety also reflected prior work
into common themes underlying meaning as significance (Davis et al., 1998;
Pakenham et al., 2004). The differences in the categories that emerged for the two
forms of meaning supported the postulations that meaning as comprehensibility and
meaning as significance were two distinct forms of meaning. For instance, within
both types of meaning, many students discussed the change that university has had on
their relationships. However, those who found meaning as comprehensibility made
sense of this by looking at it as a necessary aspect of university life while those who
found meaning as significance tried to focus on the number of new relationship
opportunities that university provided.

The final analysis presented a preliminary examination of the influence of
discovering meaning on students' levels of resilience. It assessed whether students'

levels of resilience were impacted more by them having found meaning as comprehensibility/ meaning as significance or by the specific category of these meanings they had discovered. The relationship between: (1) meaning as comprehensibility and resilience and (2) meaning as significance and resilience were therefore compared to the correlations between their associated categories and resilience. The correlations revealed that the most significant relationships existed between meaning as comprehensibility and resilience and meaning as significance and resilience. This suggested that student adjustment was more significantly influenced by whether or not they had discovered meaning and not the specific category within these meanings that they had found.

However, the influence of meaning making on students' levels of resilience was evaluated using correlations in this study, thus limiting the conclusions that can be drawn about its role in student adjustment. Therefore, the following study was performed: it presents a more in-depth analysis of the influence of meaning making on how students adapt to university life.

7.2. Study 11: Exploring the impact of meaning as comprehensibility and meaning as significance on students' levels of resilience

This study has two main aims. Primarily, it explores whether students who find meaning as comprehensibility adjust differently to university life than those who find meaning as significance (Davis et al., 1998; Davis & Morgan, 2008; Holland et al., 2006; Pakenham et al., 2004; Schok et al., 2010; Updegrafff et al., 2008). Secondly,

it examines whether the influence of finding meaning as comprehensibility and
finding meaning as significance on students' levels of resilience varies as they
progress through their university careers (Davis et al., 1998; Holland et al., 2006).

As previously discussed, findings have suggested that although finding
meaning as comprehensibility and finding meaning as significance both influence
adjustment, their impact differs as time progresses (Davis et al., 1998). Davis et al.
(1998) collected data from their participants (individuals dealing with the death of a
hospice-residing family member) at three points in time: 6-months, 13-months and
18-months post-bereavement. Their analyses uncovered differences in how meaning
as comprehensibility and meaning as significance influence adjustment at 6 months
post-loss compared to 13 months and 18 months post-loss. They specifically found
that at 6-months, both discovering meaning as comprehensibility and meaning as
significance predicted reduced levels of distress. Conversely, at 13-months and 18-
months, discovering meaning as comprehensibility no longer predicted participants'
levels of distress; only discovering meaning as significance continued to be a
significant predictor. These results hinted that the impact of finding meaning may
vary over time, suggesting that finding meaning may also vary in its influence on
how students adjust to university life throughout the course of their degrees.

However, other studies have contradicted these results (Holland et al., 2006).
Holland et al. (2006) explored the influence of the passage of time on how meaning
as comprehensibility and meaning as significance influence university students'
adjustment to bereavement. These researchers compared the levels of distress of

students who had lost family members at varying points in time over the last two years. Distress was assessed using the Inventory of Complicated Grief (ICG; Prigerson et al., 1995). This is a 30-item measure which comprises items such as "I feel like I have become numb since the death of [the deceased]" to evaluate participants' levels of various symptoms since the death such as hallucinations and sleep disturbances. Previous studies have highlighted the measure as having high reliability and validity, increasing confidence in the findings obtained. The researchers found that the influence of both forms of meaning did not differ based on time that had passed since the loss, hinting that the influence of neither form of meaning may vary across the three-year degree period. However, these researchers explored meaning making by allowing participants' to rate the degree to which they had found meaning as comprehensibility/significance in their experiences on a Likert-type scale: for meaning as comprehensibility, this scale ranged from "no sense of my loss" to "a great deal of sense" and for meaning as significance, this scale ranged from "no benefit" to "great benefit". This reliance on participants' subjective ratings of finding meaning may have led to their contradictory findings.

This study performed a similar exploration to determine the influence of finding meaning on student adjustment to university life. It was predicted that both forms of meaning will significantly positively influence students' levels of resilience. In addition, it was hypothesised that the influence of finding meaning as comprehensibility and meaning as significance on students' levels resilience will not differ across first-, second- and third-year students.

7.2.1. Method

7.2.1.1.   Participants

Among the 390 students used in the previous study, there were 158 first-year
undergraduates, 130 second-year undergraduates and 102 third-year undergraduates.
148 of these first-year undergraduate students (22 males and 126 females) filled in
the measures on a second occasion 4 months after the first point of data collection
(during weeks 1-3 of term 2). Participants again received a small financial reward or
course credit in return for participation. The mean age of this sample was 19.07 years
(Range= 19 - 23). The sample included White British (56.10 %), non-UK European
(8.80%), Asian (8.10%), Chinese (21.60%), African/Caribbean (0.70%), Black
British (0.70%) and Asian British (4.1%) students.

7.2.1.2.   Materials and apparatus

(1) Meaning making was again assessed by evaluating students' streams-of-
consciousness (Pennebaker & King, 1999) (see Section 7.1.1.2).

(2) Resilience was measured using the Connor-Davidson Resilience Scale (CD-
RISC; Connor & Davidson, 2003) as was done in previous studies.

7.2.1.3. Procedure

The procedure is detailed in Section 7.1.1.3.

7.2.1.4. Data analysis

Two sets of analyses were performed to explore the relationship between
discovering meaning and students' levels of resilience. The first of these assessments
used the data collected from the 148 first-year students described in Section 7.2.1.1.
These students were classified into two trajectories (resilience and distress) based on
the changes to their levels of resilience over the four-month period. The resilience
trajectory was operationalised by increases in resilience scores over the 4-month
period while the distress trajectory was defined by reductions in resilience scores
over the 4-month period.

Preliminary analyses then evaluated the influence of the demographic
variables. These included Pearson's chi-square and Mann-Whitney U tests based on
whether the dependent variable was categorical or continuous in nature. Finally,
binary logistic regression analyses were used to assess how the two trajectories were
related to discovering meaning as comprehensibility, discovering meaning as
significance and discovering both forms of meaning.

The second of these assessments used the 390 students described in Section
7.1.1.1 to compare the relationship between finding meaning and students' levels of
resilience across the three year groups. These analyses evaluated whether finding
meaning exerted the same influence on students' levels of resilience across the three

years of university life. This was done by examining whether time since entering

university (first-, second- and third-year of study) influenced the relationship between

finding meaning and resilience (Holland et al., 2006). For this second analysis, two

meaning making variables were created. The search for meaning as

comprehensibility and discovery of meaning as comprehensibility were scaled to

form one variable. Similarly, the search for meaning as significance and discovery of

meaning as significance were scaled to form a separate variable (Davis et al., 1998).

For both these variables, finding no meaning was coded 0; searching for meaning

was coded 0.5 and discovering meaning was coded 1 (Davis et al., 1998). This was

done for ease of interpretation of the results (Davis et al., 1998).

Two moderation analyses were then performed. The first moderation analysis

evaluated the impact of year of study on the relationship between finding meaning as

comprehensibility and resilience. The second moderation analysis evaluated the

impact of year of study on the relationship between finding meaning as significance

and resilience. The two moderation analyses are depicted in Table 7.5. Control

variables were used based on previous research (Raes, 2010).

Similar to Chapter 6, the moderation analyses were performed using Hayes and

Matthes' (2009) programme developed to facilitate the running of moderation

analyses within SPSS (Muller et al.., 2005; Preacher et al., 2007; Ng et al., 2008;

Wiedemann et al., 2009). As discussed in Chapter 6, this programme provides several

advantages. Primarily, it facilitates the implementation of the bootstrapping

Table 7.5.

The moderation analyses being performed in Study 11

Moderation analysis	Predictor variable	Moderator variables	Dependent variable	Control variables
(1)	Discovering meaning as comprehensibility	Year of study	Resilience	Discovering meaning as significance
(2)	Discovering meaning as significance	Year of study	Resilience	Discovering meaning as comprehensibility

method which was necessary given the skewness of the current data set: the

Kolmogorov-Smirnov-test revealed that scores on both meaning making variables

were significantly negatively skewed and inverse logarithmic transformations failed

to successfully remove these skews, even after the removal of outliers.

It also enabled the differentiation of the principal predictor from the moderator

variable. Therefore, it was possible to label year of study as the proposed moderator

for both models; meaning as comprehensibility as the principal predictor variable for

the first analysis and meaning as significance as the principal predictor variable for

the second analysis. The programme also provided control of the influence of

additional variables not being assessed within that particular analysis For instance,

when evaluating the interaction between discovering meaning as comprehensibility

and year of study, the influence of discovering meaning as significance was able to

be controlled and when evaluating the interaction between discovering meaning as

significance and year of study, the influence of discovering meaning as

comprehensibility was able to be controlled.

Lastly, a key part of moderation is that the relationship between the predictor

and the outcome variable changes for different values of the moderator variable. This

programme allowed an assessment of how the relationship between discovering

meaning as comprehensibility/significance and resilience changed for different years

of study. Therefore, it enabled the moderating impact of year of study to be fully

evaluated.

7.2.2. Results

7.2.2.1.   *The relationship between finding meaning in university life and resilience during the first year at university*

7.2.2.1.1.   *Preliminary analyses*

Two students, who experienced no change in their levels of resilience, were

removed from the analysis. Of the remaining 146 participants, a greater number of

the first-year students belonged to the distress trajectory (54.11%) than the resilience

trajectory (45.89%). Table 7.6 lists the sample characteristics for the two trajectories.

Pearson's chi-square test and Mann-Whitney U test were performed to determine

whether the two trajectories differed on any of these variables. The choice between

these two tests was made based on whether the dependent variable was categorical or

continuous in nature.

Table 7.6

Sample characteristics of first-year students within the resilience and distress

trajectories

Variables	Full sample	Resilience	Distress
N (%)	146 (100%)	67 (45.89)	79 (54.11)
Age (*M* [*SD*])	19.07 (1.81)	19.31 (2.13)	18.88 (1.49)
Gender (*n* [%])			
Male	22 (15.07)	7 (31.82)	15 (68.18)
Female	124 (84.93)	60 (48.39)	64 (51.61)
Ethnicity (*n* [%])			
White British	81 (55.48)	35 (43.21)	46 (56.79)
Non-UK Europeans	13 (8.90)	7 (53.85)	6 (46.15)
Asian	12 (8.22)	7 (58.33)	5 (41.67)
Chinese	32 (21.92)	15 (37.50)	17 (53.13)
African/Caribbean	1 (0.70)	1 (100.0)	0 (0.0)
Asian British	6 (4.11)	1 (16.67)	5 (83.33)
Black British	1 (0.70)	1 (100.0)	0 (0.0)
Resilience scores (*M* [SD])			
Resilience (Term 1)	63.99 (12.09)	62.86 (13.63)	65.34 (9.86)
Resilience (Term 2)	61.11 (16.79)	73.31 (10.41)	51.01 (14.15)

Table 7.6 continued

Sample characteristics of first-year students within the resilience and distress trajectories

Variables	Full sample	Resilience	Distress
Levels of discovering meaning [N (%)]			
No meaning found	45 (30.82)	11 (13.90)	34 (50.75)
Discovering meaning as comprehensibility	40 (27.40)	24 (30.40)	16 (23.88)
Discovering meaning as significance	34 (23.29)	20 (25.30)	14 (20.90)
Discover both meaning as comprehensibility and meaning as significance	27 (18.49)	24 (30.40)	3 (4.470)

Chi-square tests revealed no significant gender or ethnic differences on either of the two trajectories and no significant gender or ethnic differences for discovering either of the two forms of meaning (see Appendix K). In addition, chi-square tests revealed that students within the resilience trajectory were not significantly older than those within the distress category, χ^2 (8) =10.01, p = .264.

For resilience scores, Mann-Whitney U tests were chosen because the assumption of homogeneity of variance was violated for both sets of resilience scores (Term 1 and Term 2) (both ps <.01) and the assumption of normality was violated for resilience scores for the distress trajectory in Term 2 (p <.01). In addition, there were unequal sample sizes (see Table 7.6). Mann Whitney U tests revealed that participants within the resilience trajectory did not have significantly higher levels of resilience than those within the distress trajectory in Term 1 ($Z = 1.42$, $p = .157$). However, these differences were significant in Term 2 ($Z = 8.37$, $p = .000$). This supports the distinction between the two groups: students within the resilience trajectory were adjusting to university life while those within the distress category were having difficulties with adjustment.

Furthermore, as can be seen in Table 7.6, the majority of students within the resilience trajectory had discovered some form of meaning: similar numbers of students had either discovered both forms of meaning or discovered meaning as comprehensibility and a smaller but comparable proportion had discovered meaning as significance. On the other hand, the majority of students within the distress trajectory had not discovered any form of meaning. This suggests that finding meaning in university life may be significantly related to students' levels of resilience.

7.2.2.1.2.   Analyses of the meaning making categories for the resilience and

distress trajectories

The binary logistic regression analyses explored whether students who had

discovered both forms of meaning were significantly more likely to belong to the

resilience trajectory than: (1) those who had not discovered any meaning, (2) those

who had only discovered meaning as comprehensibility and (3) those who had only

discovered meaning as significance. This was done to assess whether finding both

forms of meaning resulted in significantly greater increases in levels of resilience

between Terms 1 and 2 and were therefore both important for student adaptation to

university life.

Within these assessments, the four levels of discovering meaning being

compared (see Table 7.6) were combined to form three independent (dummy)

variables (Field, 2013). For the first variable, discovering no meaning was coded as 0

and discovering both forms of meaning was coded as 1. This variable compared

students who had not found meaning to those who had discovered both forms of

meaning. For the second variable, discovering meaning as comprehensibility was

coded as 0 and discovering both forms of meaning was coded as 1. This variable

compared students who had discovered meaning as comprehensibility to those who

had discovered both forms of meaning. For the third variable, discovering meaning as

significance was coded as 0 and discovering both forms of meaning was coded as 1.

This variable compared students who had discovered meaning as significance to

those who had discovered both forms of meaning. These three variables thus

evaluated whether students who had discovered both forms of meaning were

significantly more likely to belong to the resilience trajectory than those who had not

discovered meaning or those who had discovered only one form of meaning (Field,

2013).

These variables were evaluated individually within three separate binary

logistic regression analyses. As in the previous study, bootstrapping was applied

(5,000 resamples with bias corrected and accelerated method). This was done due to

the presence of unequal sample sizes in the current data set (Field, 2013). A

Bonferroni correction was also used in order to reduce the likelihood that Type I error

may be increased by the three comparisons being made (Field, 2013). As such,

significant differences were considered to be present when $p < .017$.

Prior to the main analyses, the data were evaluated against the assumptions of

binary logistic regression. Field (2013) cited four main assumptions:

(1) A linear relationship exists between any continuous independent variables and

the logit of the outcome variable

(2) Independent errors

(3) Absence of bias (outliers and influential cases)

(4) Absence of multicollinearity

For the current data set, assumptions 1 and 4 were not applicable as there was only

one independent variable (level of discovering meaning) which was categorical in

nature. Therefore, the two remaining assumptions were evaluated. Examination of the

dispersion and deviation dispersion parameters suggested that the errors were

independent. In addition, there was no evidence of bias in the model. The

standardised residuals, studentized residuals, Cook's distances, leverage statistics and

DFBetas were all within the advised limits.

Within the three binary logistic regression analyses, the chi-square statistic was

significant (all ps <.001) highlighting the presence of significant differences between

the number of students within the resilience and distress trajectories who had

discovered both forms of meaning and the number of students within the resilience

and distress trajectories who had: (1) not discovered any form of meaning, (2) only

discovered meaning as comprehensibility and (3) only discovered meaning as

significance. This was further emphasised by the classification tables which indicated

that the overall accuracy of the models (discovering meaning predicting which

trajectory students belonged to) was higher than the null models.

The Wald Statistic also verified that the discovering meaning variables were

significant predictors of membership in the resilience versus the distress category (all

ps <.001). It showed that students who had discovered both forms of meaning were

significantly more likely to belong to the resilience trajectory than students who had:

(1) not discovered any form of meaning (odds ratio = 0.14, p<.001), (2) and only

discovered meaning as comprehensibility (odds ratio = 0.19, p<.01) (3) only

discovered meaning as significance (odds ratio = 0.18, p<.01) (see Table 7.7). The

bootstrap 95% CIs for the regression bs did not include 0 and the 95% CIs for the

odds ratios did not contain 1 (see Table 7.7) indicating the presence of a genuine

Table 7.7

Final model of the binary logistic analysis

Parameters	b	Odds ratio	95% CI (Odds ratio)	p
No meaning found versus Discover both meaning as comprehensibility and meaning as significance	-3.27 [-3.58,-2.08]	0.14	[0.09, 0.18]	.000
Discover meaning as comprehensibility versus Discover both meaning as comprehensibility and meaning as significance	-1.68 [-2.31, -1.29]	0.19	[0.13, 0.39]	.009
Discover meaning as significance versus Discover both meaning as comprehensibility and meaning as significance	-1.72 [-2.57, -1.17]	0.18	[0.11, 0.25]	.008

effect. These results suggest that students' levels of resilience were significantly

improved when they had found both meaning as comprehensibility and meaning as

significance in their university lives.

7.2.2.2.   *The relationship between finding meaning in university life and resilience across the years of study*

7.2.2.2.1.   *Preliminary analyses*

Mann-Whitney U and Kruskall-Wallis tests respectively explored whether there

were significant gender and ethnic differences for the three variables of interest (year

of study, the finding meaning as comprehensibility and finding meaning as

significance variables as well as students' resilience scores; see Appendix K). Mann-

Whitney U tests revealed significant gender differences for finding meaning as

comprehensibility and finding meaning as significance (both ps = .000). In addition,

Kruskall-Wallis tests showed significant ethnic differences in resilience scores (all ps

<.05). Both gender and ethnicity were thus entered as controls into the main analyses.

7.2.2.2.2.   *Analyses of the influence of the meaning making categories on resilience across the years of study*

For the first analysis (moderation 1 in Table 7.5), resilience was the dependent

variable. The principal predictor was discovering meaning as comprehensibility and

year-of-study was the moderator variable. Control variables included ethnicity,

gender and discovering meaning as significance. This model evaluated the

moderating impact of year-of-study on the relationship between discovering meaning

as comprehensibility and resilience. For the second analysis (moderation 2 in Table 7.5), resilience was the dependent variable. The principal predictor was discovering meaning as significance and year-of-study was the moderator variable. Control variables included ethnicity, gender and discovering meaning as comprehensibility. This model evaluated the moderating impact of year-of-study on the relationship between discovering meaning as significance and resilience.

Within both analyses, the interaction terms did not exert a significant impact on resilience, $p=.394$ and $p=.280$ respectively. These results showed that year-of-study did not interact with either form of discovering meaning to exert an impact on students' levels of resilience, that is, that the influence of discovering meaning on students' levels of resilience remains the same as they progress through their university lives.

7.2.3. Discussion and Conclusions

The main aim of this study was to explore the influence of finding meaning on students' levels of resilience. It performed its analysis by examining whether finding meaning predicts increased levels of students' resilience and whether this relationship changes over the course of their degrees. It was hypothesised that finding meaning as comprehensibility and finding meaning as significance would both positively influence student adjustment to university life and this effect would persist across their three-year degree programmes.

The first analysis revealed that there were significantly more students within
the resilience trajectory (had experienced increases in their levels of resilience over
the 4-month period between term 1 and term 2) who had found both meaning as
comprehensibility and meaning as significance in their university lives than those
who had: (1) found no meaning, (2) only found meaning as comprehensibility and (3)
only found meaning as significance. These results suggest that student adjustment is
influenced by the discovery of both meaning as comprehensibility and meaning as
significance. The importance of discovering both forms of meaning to adjustment
following life experiences has emerged in previous analyses (Holland et al., 2006;
Schok et al., 2010). The findings thus align with prior studies. Furthermore, as these
studies explored adjustment in other populations such as persons dealing with
bereavement and veterans of war, the current results suggest that discovering both
forms of meaning may be important to enabling adjustment regardless of the
experience.

The findings further suggest that adjusting to university is an important life
transition and helping students to find meaning in this experience should be made a
priority for universities. Tedeschi, Park and Calhoun (1998) claimed that only
experiences that are of a sufficiently extreme magnitude will disrupt and challenge
individuals' personal and world views and their sense of purpose in life (their
schemas) and subsequently trigger the meaning making process; and for these
experiences adjustment emerges when individuals have found meaning. The current
findings show that beginning university is such an intense experience. This aligns

with previous studies which describe university life as filled with challenges

including the development of identities, managing of new relationships and handling

academic demands (Jackson et al., 2000). More importantly, however, it highlights

completing the meaning making process as primordial to student adjustment to

university life. As such, it hints that aiding students to find meaning as

comprehensibility and meaning as significance in their university lives may be the

most important means through which universities can promote student adjustment.

This is further emphasised by the results of the second analyses. Here the

significant positive influence of discovering meaning as comprehensibility and

meaning as significance on students' levels of resilience remained unchanged across

all three year groups. These findings suggest that how students adjust throughout

their university lives is significantly influenced by whether or not they discover both

forms of meaning. On the one hand, as previously asserted, this further highlights the

importance of aiding students to find meaning in their university lives in order to

promote adjustment throughout the degree period. Results have suggested that

students' psychological health can increasingly suffer as they progress through

university (Stallman, 2010). Therefore, these findings show that programmes which

teach students how to find either meaning as comprehensibility or meaning as

significance in their university lives within their first year of university may improve

how they adjust throughout the three-year period.

On the other hand, these results suggest that discovering meaning has a

different impact based on the population being evaluated. They align with previous

findings concerning adjustment to bereavement among college undergraduates [mean age = 21.0 years] (Holland et al., 2006) but do not align with analyses in older populations [mean age = 51.2 years] adjusting to bereavement which found that only discovering meaning as significance continued to exert a significant influence on adjustment over time (Davis et al., 1998). This means that age may impact whether finding both forms of meaning influence adjustment. It can be argued that other aspects differed within the two studies such as the characteristics surrounding the loss: Holland et al. explored adjustment following bereavement among university students who had lost a variety of persons ranging from family members to friends in a variety of ways from natural, anticipated causes to fatal accidents whereas Davis et al. (1998) explored loss of hospice-residing family members. However, the current findings suggest that these differences may be attributed to the influence of age on meaning making as university undergraduates adjusted to their experiences by finding both forms of meaning. Therefore, as one ages, finding meaning as significance may become more important than finding meaning as comprehensibility. This hints that the impact of finding meaning on adjustment to university life may differ among persons who are older than those within the current sample (range = 18-24 years). As such, universities may need to tailor more programmes for their more mature students.

7.3   General Discussion and Conclusions

This Chapter had two main aims. Primarily, it set out to explore whether students made meaning of university life in two distinct ways as espoused in prior

studies. Secondly, it sought to examine the impact of meaning making on student adjustment to university life. For the first aim, the various analyses revealed that students found meaning in their university lives in two distinct ways: (1) meaning as comprehensibility where they attempted to fit their new university experiences into existing schema (e.g. "However, I do realise that you can't just stay here forever, and that eventually I will have to get a job and contribute to society") and (2) meaning as significance where they sought to derive some benefit from their university experiences (e.g. "The opportunities are endless, there are friends constantly on tap – people are always around, there is always something to do"). These results were similar to those derived in previous explorations with additional themes emerging in the content analyses specifically focused on the changes that university had brought to students' lives. The findings therefore support previous explorations into discovering meaning (Davis et al., 1998; Pakenham et al., 2004) and suggest that, similar to individuals facing other experiences, students can also discover both meaning as comprehensibility and meaning as significance in their university lives.

For the second aim, the analyses revealed that both forms of meaning significantly influenced student adjustment. Among first-year students, those whose levels of resilience increased within the first four months of university had found both meaning as comprehensibility and meaning as significance in their university lives. In addition, the significant positive impact of finding both forms of meaning persisted among second- and third-year students. This substantiates previous findings which suggested that what matters most to adjustment was whether or not

participants had discovered both forms of meaning (Holland et al., 2006; Schok et al., 2010). In addition, it supports prior results concerning the continued impact of both forms of meaning on how university students adjust to other experiences over time such as bereavement (Holland et al., 2006). These researchers explored how university students were adjusting to bereavement (mean age = 21.0 years) which is comparable to the current sample (mean age = 19.08 years). The present findings therefore also hint that discovering both forms of meaning may play a significant role in adjustment to any experience within the university-aged population, including adaptation to university life.

This study also revealed that female students were significantly more likely to discover meaning as comprehensibility and meaning as significance in their university lives. These significant gender differences align with previous research (Bevvino & Sharkin, 2003; Reissman, 1990). For instance, Bevvino and Sharkin (2003) found that women were significantly more likely to report positive meaning following their divorce than male participants. Specifically, their qualitative analysis revealed that in response to the question "What was/were the positive consequences of your divorce?", sixty-four percent of the female participants identified changes in self or identity and/or new opportunities for personal growth/development, whereas the majority of male participants (87%) answered this question with "no response" or "no positive consequences". As finding meaning has been linked to better adjustment following life experiences across both genders in previous research (Edwards & Holden, 2001; Murphy, Clark Johnson & Lohan , 2003) as well as in the current

study, the findings suggest that male students may be more likely to have difficulty adjusting to university life. Future research should therefore explore the experiences of male students in adapting to being at university.

In addition, significant ethnic differences were found in resilience scores: here White British students were found to be significantly more resilient than Chinese and Asian students. These findings also align with previous empirical work which suggested that international students have to handle a range of additional challenges throughout their university lives (Khawaja & Stallman, 2011). These researchers explored the university experiences of 22 international students within an Australian university and found that students reported dealing with a wide range of situations such as social isolation, academic difficulties and culture shock. For instance, one student reported "When I first caught the bus, I didn't know how to press the buzzer, I was screaming stop, stop" (p. 11) and another said "When the Lecturer asks us a question, I can't raise my hand to answer because I am afraid that my grammar is not good enough and I am a slower speaker than Australian students. I know the answer but when I don't know the English vocabulary. I don't answer the question and I feel depressed" (p. 15) The current study hinted that a similar trend may exist whereby international students (Chinese and Asian students specifically) may encounter additional challenging university experiences, which may make it harder for them to adjust to their university lives. Future research should also thus evaluate the experiences of international students in adapting to being at university.

So far it has been established that four cognitive processes influence resilience:
(1) negative thinking styles, (2) positive thinking styles, (3) discovering meaning as
comprehensibility and (4) discovering meaning as significance. Chapter 1 proposed
that these cognitive processes would interact to influence student adjustment such
that negative/positive thinking styles would impact whether or not students high on
negative trait emotion are able to find meaning and thus develop higher levels of
resilience. The next Chapter will therefore evaluate how the relationship between
negative thinking styles, positive thinking styles and meaning making influences
whether students high on trait inhibition adjust to university life.

Chapter 8 Exploring the proposed model of how cognitive processes influence student adjustment to university life

This Chapter integrates the main findings from the prior eleven studies of the current thesis in order to evaluate the cognitive processes that influence student adjustment to university life. It specifically explores how the levels of resilience of students high on trait inhibition are influenced by an interaction between: (1) their negative and positive thinking styles and (2) whether or not they discover meaning in their university lives. A brief review of how the previous results of the current thesis have impacted this final study is presented below.

The exploration of students high on trait inhibition was triggered by the findings of Chapters 3 – 6. The results of Chapters 3 and 4 suggested that the three negative trait emotions initially evaluated (trait anger, trait anxiety and trait depression) were not related with distinct trait-congruent longer-term thinking patterns. This meant that exploring the cognitive processes specifically associated with each of these three negative trait emotions may not be pertinent to understanding how cognition impacted student adjustment. These suggestions were further evaluated in the factor analyses of Chapter 5. The results of this Chapter supported these claims: they hinted that negative trait emotion was not associated with three independent traits, but rather with two traits – trait inhibition (high trait BIS) and trait activation (high trait BAS). These two traits were subsequently incorporated into the evaluations of Chapter 6. Within this Chapter, the results showed that trait activation was not significantly related to resilience. As such, the current analysis does not evaluate trait activation (high trait BAS), but focuses on the cognitive processes

through which trait inhibition (high trait BIS: a predisposition toward a persistent

vigilance for threat and a subsequent propensity toward avoidant behaviour)

influences students' levels of resilience.

As previously mentioned, two cognitive processes are the focus of the current

analysis: (1) students' thinking styles and (2) whether or not students have found

meaning in their university lives. The evaluation of students' thinking styles is

motivated by the findings of Chapters 3, 4 and 6. Chapters 3 and 4 found that

negative and positive thinking styles significantly mediated the relationship between

negative trait emotion and resilience but negative and positive cognitive appraisals

did not exert any impact. These results suggested that automatic cognitive processes

may not play a role in how students high on negative trait emotion adjust to

university life. Instead, longer-term cognitive processes seemed to be of more

importance, specifically increased negative thinking and reduced positive thinking.

This was supported by the findings of Chapter 6 which showed that alternative

cognitive processes – complex negative and complex positive thinking styles – did

not influence these students' levels of resilience. Therefore, the current analysis

examines how increased negative and reduced positive thinking styles impact the

levels of resilience of students high on trait inhibition.

The findings of Chapter 7 motivated the exploration of discovering meaning as

comprehensibility and meaning as significance within the current study. These results

showed that, similar to previous findings (Davis et al., 1998; Holland et al., 2006;

Pakenham et al., 2004), students were able to find both meaning as comprehensibility

and meaning as significance in their university lives. In addition, these two forms of meaning emerged as positively influencing students' levels of resilience in the first, second and third years of being at university. This meant that student adjustment to university was promoted by their finding both meaning as comprehensibility and meaning as significance in their university experiences. Thus, the current analysis explores how finding meaning as comprehensibility and meaning as significance impacts the levels of resilience associated with high trait inhibition.

As such, the current analysis was motivated by all of the previous studies within the current work: the significant results that emerged suggested that students high on trait inhibition may have difficulties adjusting to university as a result of both their thinking styles and their reduced capacity to find meaning. Research has shown that thinking styles may influence whether individuals are able to find meaning in the particular experience and in this way impact how individuals adjust to the event (Davis et al., 1998; Schok et al. 2010). As such, the current chapter sets out to evaluate the following model: trait inhibition → thinking styles → discover meaning (comprehensibility/ significance) → resilience.

8.1   Study 12: An exploration of the impact of thinking styles and meaning making

Figure 8.1 shows how the impact of negative thinking styles, positive thinking styles and discovering meaning (comprehensibility/ significance) on the levels of resilience of students high on trait inhibition will be explored. It was hypothesised
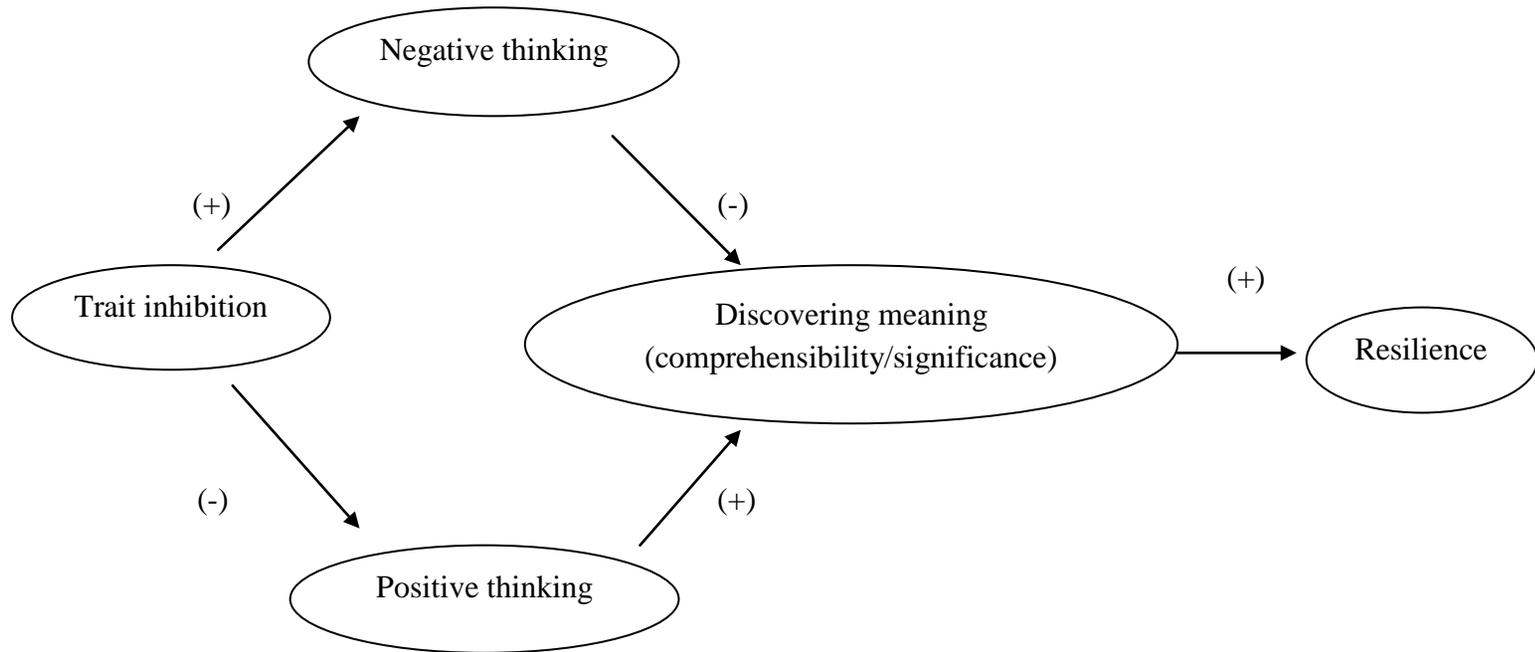
Figure 8.1 Graphic representation of the mediation model being evaluated in Study 12

that the relationship between trait inhibition and resilience would be fully mediated

by negative/positive thinking styles and discovering meaning (comprehensibility and

significance) as shown in the model and that this model would provide a good fit to

the data.

8.1.1   Method

8.1.1.1   Participants

This study utilised the first-, second- and third-year students from Study 10 (see

Section 7.1.1.1).

8.1.1.2   Materials and apparatus

(1) A composite score was again created using 20 items from the STAI

(Spielberger et al., 1983) and 10 items from the STPI-TD (Spielberger et al., 1995) to

evaluate students' levels of trait inhibition. This was done by summing the

standardised scores on the two measures (Samaniego & Gonsalez, 1999). The

composite measure had high reliability in the current study (alpha = 0.89).

(2) Negative thinking styles were measured using a measure of rumination - the

Rehearsal subscale of the most recently revised version of the Emotion Control

Questionnaire (ECQ3; Roger et al., 2011).

(3) The Life Orientation Test–Revised (LOT-R; Scheier et al., 1994) – a

measure of optimistic thinking – was used to evaluate positive thinking styles.

(4) Meaning making was assessed by evaluating students' streams-of-

consciousness (Pennebaker & King, 1999) (see Section 7.1.1.2). As in Study 11, the

responses for the search for and discovery of meaning as comprehensibility were

scaled to form one variable while the search for and discovery of meaning as

significance were scaled to form a separate variable (Davis et al., 1998)

(5) Resilience was again evaluated with the Connor-Davidson Resilience Scale

(CD-RISC; Connor & Davidson, 2003).

8.1.1.3   Procedure

The procedure is detailed in Section 7.1.1.3.

8.1.1.4   Data analysis

The proposed mediation model (see Figure 8.1) was analysed using path

analysis within AMOS (19.0, IBM statistics). Path analysis was chosen because it

facilitates an evaluation of the significance of each of the proposed paths within the

model and enables further amendments to be made so that the final model will best

detail the relationships between the variables (Kline, 2011). As with previous

analyses (see Chapters 3 and 4), the maximum likelihood estimation technique (ML;

Arbuckle, 2010) was applied.

Preliminary analyses revealed that scores on the rumination measure were

significantly positively skewed while scores on the optimistic thinking measure and

both meaning making variables were significantly negatively skewed. Logarithmic

and inverse logarithmic transformations failed to successfully remove the skew on these variables, even after the removal of outliers. Therefore, in addition to χ^2, four approximate fit indices (AFIs) were used within the ML analysis: (1) Comparative Fit Index (CFI), (2) Tucker-Lewis Index (TLI), (3) Root Mean Square Error of Approximation (RMSEA) and (4) Akaike Information Criterion (AIC). A cut-off of 0.95 was used for the CFI and the TLI, as for these AFIs, values closer to 1.00 indicate a better fit (Hu & Bentler, 1999; Kline, 2011). For the RMSEA, values $\leq$ 0.05 indicate close approximate fit, values between 0.05 and 0.08 suggest reasonable fit, and values $\geq$ 0.10 suggest poor fit. Therefore, a cut-off of 0.05 was used. With the AIC, values for all models were compared and the model with the lowest AIC was labelled the best fit to the data.

8.1.2.   Results

8.1.2.1.   *Descriptive statistics*

Means, standard deviations and ranges are reported in Table 8.1. For the negative thinking, positive thinking and resilience measures, the means remained generally comparable to prior research in similar undergraduate populations (Bitsika et al., 2010; Burris et al., 2010; Chang et al., 2000; Culhane & Morera, 2010; Litman et al., 2005; Roger & Najarian, 1989; Spielberger, 1999; Spielberger et al., 1983, Spielberger, 1995). As trait activation, trait inhibition and the meaning making variables were created specifically for this analysis, their means could not be compared to other studies.

Table 8.1

Means, standard deviations and ranges for the predictor, mediator and outcome

variables in Study 12

Variable	M	SD	Range
Trait inhibition[a]	0.00	1.72	-4.64 – 4.56
Negative thinking styles	7.69	3.23	0.00 – 17.00
Positive thinking styles	18.66	4.45	6.00 – 30.00
Meaning as comprehensibility	0.65	0.34	0.00 – 1.00
Meaning as significance	0.61	0.35	0.00 – 1.00
Resilience	64.71	12.29	29.00 – 95.00

Note [a] Variables are based on standardised scores with a mean of 0

8.1.2.2   *Preliminary analyses*

Data were assessed against the assumptions for path analysis (Kline, 2011):

(1) Temporal precedence – the cause (X) precedes the effect (Y): Within this study

there was no temporal precedence. However, Kline states that when temporal

precedence is absent, valid results can be assured when there is "a clear, substantial

rationale...for specifying that X is a cause of Y" (Kline, 2011, p. 113). Evidence in

support of this can be found in Sections 1.4 and 1.5. Here the association between

thinking styles and meaning making and the influence of this association on the

relationship between negative trait emotion and resilience was discussed respectively.

(2) Covariation between X and Y: Evidence of this relationship is shown in Table

8.2.

(3) No other plausible explanations of the covariation between X and Y exist:

Evidence in support of this was also discussed in Sections 1.4 and 1.5. In addition,

evidence was given in Section 1.3 where the influence of alternative factors was

considered.

(4) The distribution meets the assumption of the test being used: Path analysis

requires a normal distribution. As previously discussed, within the current data set

this assumption had been violated. Therefore, bootstrapping was performed using the

maximum likelihood estimation method with 2,000 resamples (Byrne, 2010; Kline,

2011; Martin, 2012; Utsey et al., 2007).

(5) The direction of the causal relationship is correctly specified: Evidence in

support of this was provided in three sections. Section 1.2 detailed the relationship

between negative trait emotion and resilience. In addition, Section 1.4 discussed the

relationship between cognition and resilience while Section 1.5 described the

relationship between negative trait emotion and cognition.

Table 8.2.

Correlations between trait inhibition, negative thinking, positive thinking, discovering meaning and resilience

Variable	1	2	3	4	5	6
(1) Trait inhibition		0.32***	-0.58***	0.15**	-0.39***	-0.52***
(2) Negative thinking			-0.29***	-0.11*	-0.22**	0.35***
(3) Positive thinking				-0.13*	-0.29**	0.33***
(4) Discovering meaning (comprehensibility)					0.20**	0.55***
(5) Discovering meaning (significance)						0.51***
(6) Resilience						

Notes: ***p <.001, **p < 0.01, *p <.05

8.1.2.3.   *Path analyses*

Fit indices for the model suggested it did not present a good fit to the data, χ^2
[5, N=390] = 63.16, *p* =.000, TLI=0.83, CFI=0.90, RMSEA=0.17, AIC=95.16.
Therefore, attempts were made to adjust the model in order to develop a better-fitting
depiction of the relationships between the variables (Byrne, 2010).

8.1.2.3.1.   *Adjusting the model*

As proposed by Byrne (2010), adjustments were made by examining the
significance of the paths within the model (see Table 8.3). Two parameters were not
significant: (1) the relationship between negative thinking styles (rumination) and
discovering meaning as significance and (2) the relationship between positive
thinking styles (optimistic thinking) and discovering meaning as comprehensibility
(See Table 8.3). This suggested that: (a) negative thinking styles do not influence
whether or not students discover meaning as significance and (b) positive thinking
styles do not influence whether or not students discover meaning as
comprehensibility.

These results hinted that negative thinking styles and positive thinking styles
differed in how they influenced students' capacity to find meaning in their university
lives. The possibility of such differences was put forth by Davis et al. (1998). These
researchers argued that because meaning as comprehensibility and meaning as
significance represent two distinct construals of meaning, the two forms of meaning

Table 8.3

Regression weights of the relationships between the variables within the model

Independent variable	Dependent variable	β	P
Trait inhibition	Rumination	.81	.000
Trait inhibition	Optimistic thinking	-1.65	.000
Optimistic thinking	Discovered meaning as comprehensibility	-.01	.581
Optimistic thinking	Discovered meaning as significance	.07	.000
Rumination	Discovered meaning as comprehensibility	-.09	.003
Rumination	Discovered meaning as significance	-.03	.079
Discovered meaning as comprehensibility	Resilience	8.59	.000
Discovered meaning as significance	Resilience	12.01	.000

would be influenced by different variables. They thus evaluated whether

participants' levels of pre-loss optimistic thinking predicted whether they found

meaning at 6-months post-loss. The results showed that levels of pre-loss optimistic

thinking significantly predicted whether or not individuals found meaning as

significance at 6-months post-loss but not whether or not they found meaning as

comprehensibility. Their findings suggest that the two forms of meaning may be

influenced by different factors.

Although, these researchers did not explore the impact of negative thinking on

participants' discovery of meaning as comprehensibility, additional findings suggest

that negative thinking may differ from positive thinking in how it exerts its impact

(Chang, 1996; MacLeod, Tata, Tyrer et al., 2010). For instance, research has shown

that the impact of training to reduce negative thinking may be hampered by students'

existing levels of positive thinking (Ruthig, Perry, Hall and Hladkyj, 2004). In

addition, studies have found distinctions in how positive and negative thinking

influence other variables (Goodhart, 1985; Kendall, Howard & Hayes, 1989;

MacLeod, Tata, Tyrer et al., 2010). Based on these results and the non-significant

regression weights (see Table 8.3), the hypotheses were adjusted to acknowledge the

potential that negative and positive thinking may influence how students find

meaning in their university experiences in different ways.

8.1.2.3.2.   *Analysing the re-adjusted model*

The two non-significant parameters were removed (see Table 8.3) and the

adjusted model was re-analysed. This model was a good fit to the data, χ^2 [5, N=390]

= 7.90, *p*=.095, TLI=0.95, CFI=0.97, RMSEA=0.05, AIC=41.90. The AIC was the smallest for the proposed model compared to the saturated and independent models. Thus, this adjusted model was retained, suggesting two main things: (1) that students who successfully adjusted to university possessed positive thinking styles which helped them to find meaning as significance in (derive benefit from) their university lives and (2) that students who did not successfully adjust to university possessed negative thinking styles which hindered them from finding meaning as comprehensibility in (making sense of) their university lives.

The standardised solution for the model is shown in Figure 8.2, with measurement error effects omitted for clarity (Houghton & Jinkerson, 2007). The model explained 50.68% of the variance in students' resilience scores.
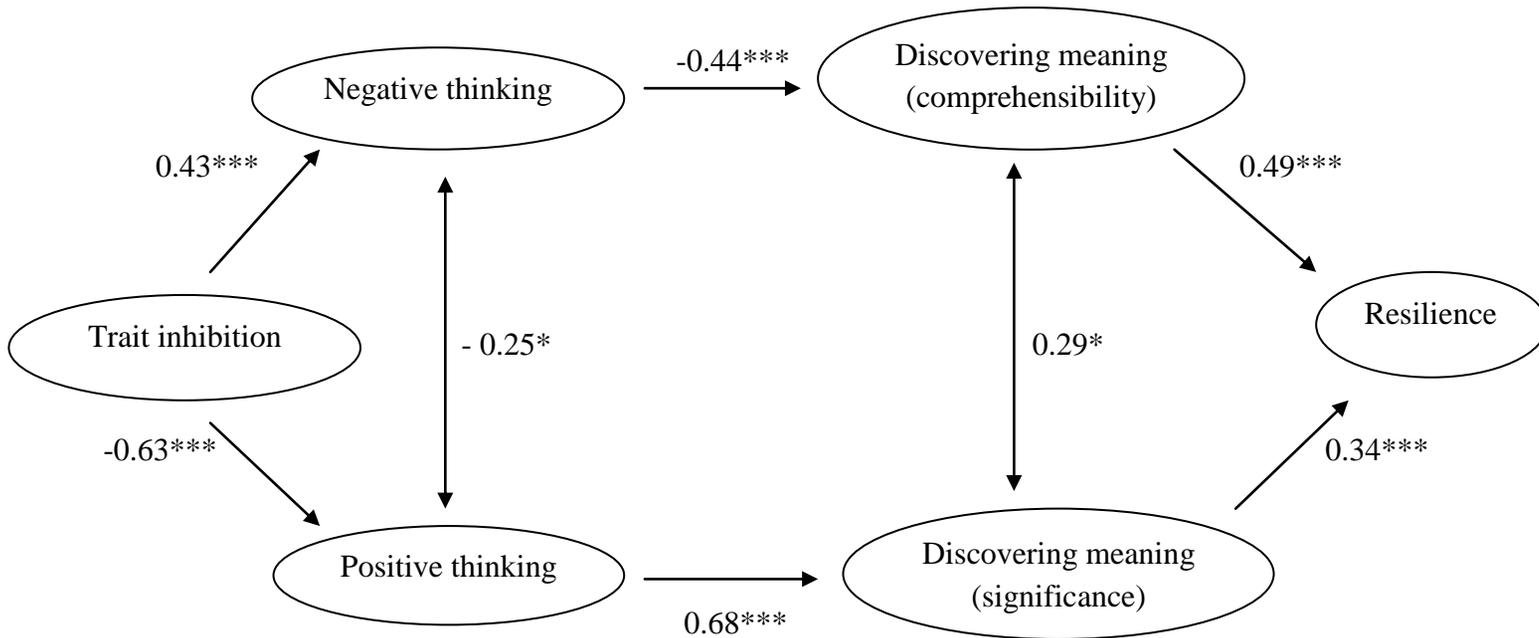
Figure 8.2. The best fitting model regarding the variables mediating the relationship between trait inhibition and resilience.

8.1.3.   Discussion and Conclusions

This Chapter evaluated the proposed mediation model developed based on the

results of the various analyses within this thesis. The findings revealed that thinking

styles influenced student adjustment in two main ways: (1) students who adjusted

well to university life were more likely to have discovered meaning as significance

(found benefit) in their university experiences as a result of their positive thinking

styles and (2) students who adjusted poorly to university life were more likely to not

have discovered meaning as comprehensibility in (made sense of) their university

experiences as a result of their negative thinking styles. This model explained

50.68% of the variance in students' resilience scores.

These results highlight the importance of finding meaning to understanding

students' difficulties adjusting to university life. They thus substantiate the role of

finding meaning on adjustment as highlighted in previous studies (Davis et al., 1998;

Holland et al., 2006; Pakenham et al., 2004; Schok et al., 2010; Updegraff et al.,

2008). In addition, they emphasize the importance of students' thinking styles,

supporting the impact of thinking styles on adjustment that emerged in prior research

(Fredrickson, 2001; Kocovski et al., 2005; Molina et al., 1998; Nolen-Hoeksema et

al., 2008).

More importantly, however, the findings hinted that students' personality

differences may influence their levels of resilience through the interaction of different

cognitive processes. The model specifically indicated that students' levels of trait

inhibition exerted a harmful influence on their capacity to build higher levels of

resilience by hindering them from find meaning in university life, and that this

difficulty in finding meaning was due to their thinking styles. These results suggest

that adjustment among students high on trait inhibition can be promoted not only by

emphasizing the need to find meaning but also through modification of students'

thinking styles. This supports the arguments of Cantor (1990) concerning the need to

understand the cognitive processes through which personality traits exerted their

impact: it highlights the importance of targeting the cognitive processes that may

underlie students' personality differences in order to improve how they adjust to

university life.

It should also be noted that, as detailed in the model, negative thinking styles

and positive thinking styles exerted their impact on student adjustment in different

ways: students' negative and positive thinking styles influence whether they are able

to find meaning as comprehensibility or meaning as significance respectively. This

aligns with previous findings which revealed that positive thinking and negative

thinking varied in how they influenced participants' well-being (MacLeod, Tata,

Tyrer et al., 2010). It therefore suggests that in order to promote student adjustment,

it is important to target both students' positive and negative thinking styles, rather

than solely focusing on either increasing their positive thinking (Emmons & Stern,

2013) or decreasing their levels of negative thinking (Hall, Hladkyj, Perry & Ruthig,

2004)..

This Chapter thus essentially highlights that in order to effectively aid students

who have difficulty adjusting to university, programmes should be focusing on

multiple cognitive processes, namely: (1) decreasing students' levels of negative

thinking, (2) increasing their levels of positive thinking and (3) guiding them in

finding some form of meaning in university life. The next Chapter will discuss the

main aspects of these findings and outline their theoretical and practical implications.

Chapter 9 Discussion and Conclusions

This thesis set out to examine the cognitive processes that influence student adjustment to university life. It sought to compare the impact of: (1) cognitive processes that were automatic in nature to those that were longer-term and pervasive in nature (referred to as thinking styles) and (2) cognitive processes that were maladaptive (negative) in nature to those that were adaptive (positive) in nature. It also aimed to determine whether these cognitive processes exerted their impact by influencing how students' made meaning of their university lives. Through a series of twelve studies, the influence of these processes on student adjustment was evaluated. The results showed that longer-term cognitive processes exerted a superior impact on how students adjust to university life by influencing how they made meaning of being at university in two ways: (i) maladaptive (negative) thinking styles influenced whether students were able to find meaning as comprehensibility in their university lives and (ii) adaptive (positive) thinking styles influenced whether students were able to find meaning as significance in their university lives. This Chapter presents a discussion of these findings in light of the literature, specifically highlighting how the current results influence existing empirical work and what they reveal about how student adjustment can be improved.

The review will begin by considering how the findings relate to the trait-congruent hypothesis and evaluating what the two emerging traits (trait activation/trait inhibition) reveal about student adjustment to university life. Following this, an examination of the findings concerning the relationships between trait activation/trait inhibition, cognitive processes and students' levels of resilience

267

will be presented, considering what these relationships show us about student

adjustment to university life. The impact of finding meaning as comprehensibility

and meaning as significance on students' levels of resilience will then be discussed.

Here, what the relationship between negative/ positive thinking styles and finding

meaning tells us about student adjustment will also be evaluated. The Chapter will

conclude with a review of the strengths and limitations of the empirical work

included in this thesis and suggest avenues for future research that can further

enhance the understanding of student adjustment to university life that the current

work has provided.

9.1. Research Aims and Main Findings

9.1.1. The trait-congruent hypothesis

The current thesis set out to examine whether the trait-congruent hypothesis

influenced student adjustment using an original approach. Its analyses included three

original features (Chapters 3 and 4). Primarily, it incorporated video stimuli to assess

automatic cognitive appraisals (Study 1). Secondly, it evaluated if, and how, the trait-

congruent hypothesis was related to longer-term cognitive processes (Studies $1-6$).

This represented an original contribution for two main reasons: (1) existing empirical

work into longer-term cognitive processes had focused mainly on one negative trait

emotion (Berry et al., 2005) and (2) previous research had not compared the impact

of automatic cognitive processes to a longer-term and pervasive thinking pattern

(Bryant, 2003; Gum & Snyder, 2002; Molina et al., 1998; Raes, 2010; Scheier &

Carver, 1985; Watkins & Teasdale, 2004). Thirdly, it examined how the trait-

congruent hypothesis was related to both adaptive (positive) and maladaptive (negative) cognitive processes.

The findings of the first two empirical chapters (Chapter 3 and 4) revealed that although the three negative trait emotions being evaluated (trait anger, trait anxiety and trait depression) were related to trait-congruent negative automatic cognitive appraisals; they were not associated with trait-congruent longer-term thinking patterns. This suggested that negative trait emotion may not influence student adjustment through trait-congruent cognitive processes. This was supported by the results of Chapter 5 which revealed that negative trait emotion was best assessed using a two-factor structure comprising traits related to the behaviour inhibition system (BIS) and the behavioural activation system (BAS), labelled trait inhibition and trait activation respectively. In the former case, students would be predisposed to persistently seek out rewards in their environment and prone to pursue these even in cases of high threat. In the latter case, students would be predisposed to persistently seek out threats in their environment and prone to avoidance behaviour.

9.1.1.1.   Theoretical Implications

Similar findings have emerged in previous studies exploring the link between trait anger and the BAS (Harmon-Jones, 2003; Harmon-Jones & Harmon-Jones, 2010). The current findings extend the existing literature: they support a relationship between negative trait emotion and the BIS, suggesting that the BAS/BIS may in fact explain the impact negative trait emotion on individuals' behaviour - in this case, how students adjust to the University of York.

The results further suggest that the trait-congruent hypothesis may be pertinent solely to automatic cognitive processes: each trait was related to trait-congruent cognitive appraisals. This aligns with the suggestions of Rosenberg (1998) who linked the trait-congruent hypothesis to the automatic cognitive processes that precede emotions and emotional expression. This was again suggested by Wilkowski and Robinson (2008) in their evaluation of the cognitive processes associated with trait anger. Therefore, the current findings again extend the existing literature: they hint that the trait-congruent hypothesis may not be relevant to understanding longer-term thinking patterns. However, this needs to be explored in future investigations.

9.1.1.2.   Practical Implications

The findings show that negative trait emotion does not influence student adjustment through the impact of trait anger, trait anxiety and trait depression. Instead, its influence is associated with the BAS and the BIS. These findings have important practical implications. They highlight trait BAS and trait BIS as potent personality traits to understanding student adjustment as they explain the impact of another personality trait on student adaptation to university life. This essentially means that in order to improve student adjustment, the focus may need to be placed on the cognitive processes related to trait BAS/BIS. This was supported in the present study: trait-congruent differences associated with negative trait emotion did not play a significant role in student adaptation to university. However, further research is warranted which explores the relationship between the BAS/BIS and other personality traits implicated in adjustment, comparing the impact of their associated cognitive processes on how students adapt to university life.

270

9.1.2.   Trait activation, trait inhibition, thinking styles and student adjustment

The thesis set out to explore the impact of the overarching longer-term thinking pattern, referred to as thinking styles. This longer-term thinking pattern has been hinted at in previous studies such as multidimensional scaling (Segerstrom et al., 2003), meta-analysis (Watkins, 2008) and generalizability theory analysis (Siegle, More & Thase, 2004). However, researchers continue to interpret their findings according to the specific dimension of longer-term thinking that they evaluate (Fresco et al., 2002; Harris et al., 2008; Kocovski et al., 2005; Molina et al., 1998; Nolen-Hoeksema et al., 2008; Segerstrom et al., 2003; Watkins & Teasdale, 2004; Watkins, 2008). The current work thus explored the impact of longer-term cognitive processes on student adjustment using an original approach – a comparison of maladaptive (negative) and adaptive (positive) thinking styles.

The results of Chapters 3 and 4 showed that trait anxiety and trait depression exerted a strong significant influence on students' levels of resilience through reduced negative and increased positive thinking styles. However, trait anger was only modestly negatively related to students' levels of resilience through reduced negative thinking styles. Furthermore, within Chapter 6 a significant relationship between trait activation and students' levels of resilience did not emerge. These results suggested that negative trait emotion exerts its impact on student adjustment through a single trait – trait inhibition – and its associated increased negative and reduced positive thinking styles.

9.1.2.1.   Theoretical implications

On the one hand, the current findings suggested that students high on trait BAS (predisposed to seek out rewards in their environment in spite of potential risks) may not have difficulties adjusting to university life. This substantiates prior findings linking a heightened BAS (trait activation) to such maladaptive responses as aggressive behaviour (Smith & Kuppens, 2005) which has been described by researchers as distinct from resilience (Hunter & Chandler, 1999; Rutter, 2007). On the other hand, the results show that trait inhibition influences students' levels of resilience through reduced negative and increased positive thinking styles. Primarily, this suggests that students may adjust poorly to university life if they are hypervigilant to threat within the university environment, and thus prone to avoid these experiences until safety is assured. This link supports prior empirical work which has associated heightened activity in the BIS with mental ill heath such as suicidal thinking (O'Connor & Forgan, 2007) and depression (Field, Diego & Hernandez-Reif, 2001).

However, the current work adds to these existing findings by highlighting the role played by both negative and positive thinking styles. Although several earlier studies have focused on differentiating between the two forms of thinking (Chang, 1996; Goodhart, 1985; Kendall et al., 1989), limited work has been done in this area within recent years (MacLeod et al., 2005; Segerstrom et al., 2003; Watkins, 2008). Research tends either to highlight the benefits of positive thinking (Egan et al., 2011; Scheier & Carver, 1993; Schok et al., 2010) or emphasize the harmful impact of negative thinking (Fredrickson, 2001; Kocovski et al., 2005; Molina et al., 1998;

Nolen-Hoeksema et al., 2008). The present results highlight the need to explore how each of these thinking styles exerts their impact.

9.1.2.2.   *Practical implications*

The findings emphasize the need for further exploration of the role played by trait inhibition, but not trait activation, on student adjustment. This is accentuated by the previous results introduced above highlighting a significant relationship between the BIS and suicidal thinking (O'Connor & Forgan, 2007) as well as depression (Field, Diego & Hernandez-Reif, 2001), particularly given the high levels of mental health problems and student dropout rates that have been reported among university students (Stallman, 2010).The results specifically hint at two preventative measures that universities can incorporate: (1) they can seek out students who engage in avoidant behaviour and/or (2) they can use the trait inhibition measure as a screening tool to identify students who may be at risk for poor adjustment to university life.

The current results also highlight the need for programmes that promote student adjustment by tackling students' levels of both negative thinking and positive thinking. The present trend is to focus either on increasing students' positive thoughts such as by targeting their levels of gratitude (Emmons & Stern, 2013) or reducing students' levels of negative thinking for instance by targeting their attributional biases (Hall et al., 2004). However, as discussed in Chapter 8, research has shown that the impact of training to reduce negative thinking may be hampered by students' existing levels of positive thinking (Ruthig et al., 2004). Therefore, both represent

important targets for universities when promoting student adjustment and should both

be explored in further research.

9.1.3.   The role of meaning making in student adjustment

The last original contributions made within the current work involves: (1) its

exploration of the role played by finding meaning in student adjustment and (2) its

evaluation of how cognitive processes interact to influence student adjustment. As

discussed in Chapter 1, discovering meaning in a particular experience has been put

forth by several researchers as the main cognitive process that influences adjustment

(Davis et al., 1998; Holland et al., 2006; Pakenahm et al., 2004; Schok et al., 2010;

Updegraff et al., 2008). They specifically implicate the discovery of meaning as

primordial for adjustment to events that challenge individuals' schemas such as their

beliefs that life has a purpose and the world is just and controllable (Tedeschi et al.,

1998; Pakenham et al., 2004).

Although researchers have postulated that beginning university presents

students with severe challenges and demands, and requires a great deal of adjustment

(Jackson et al., 2000), no prior empirical work has validated this by implicating the

search for and discovery of meaning. The current study sought to broaden the

existing understanding of adjustment to university life by examining whether

university life causes students to seek out and discover meaning in their university

experiences. This was explored in Chapter 7 where the results showed that: (1)

students can find meaning in their university lives in two distinct ways - meaning as

comprehensibility or meaning as significance and (2) students' levels of resilience

were significantly influenced by whether or not they were able to find both forms of meaning in their university lives.

In addition, the thesis aimed to explore the cognitive processes that may influence students' capacity to find such meaning. Studies have suggested that individuals' capacity to discover meaning in their experiences may be impacted by their existing thinking patterns (Davis et al., 1998; Davis and Morgan, 2008; Schok et al., 2010). However, these studies have mainly explored the role played by optimistic thinking (Davis et al., 1998; Schok et al., 2010). The thesis sought to fill this gap by tackling the following research question: Can the impact of students' positive and negative thinking styles on their difficulties adjusting to university be a result of their inability to find meaning of their university lives? The role of negative and positive thinking on the impact of meaning making and its relationship to students' thinking styles was examined in Chapter 8. The results showed that among students high on trait inhibition, that is, those who are likely to have difficulty adjusting to university life, thinking styles influenced discovering meaning in two ways: (1) increased negative thinking influenced students' resilience by preventing them from finding meaning as comprehensibility and (2) reduced positive thinking influenced students' resilience by helping them to find meaning as significance.

9.1.3.1.   Theoretical Implications

The findings present two key theoretical implications. Primarily, they substantiate previous arguments suggesting that beginning university represents a sufficiently intense experience which causes students to question the core beliefs and assumptions within their schema and can thus lead to intense difficulties with

adjustment causing academic dropout or mental health problems (Jackson et al.,

2000; Pancer, 2000; Stallman, 2010; 2011). Therefore, in addition to populations

such as veterans (Schok et. al, 2010) and those coping with bereavement (Holland et

al., 2006), future studies should explore student adjustment as a means of

understanding how individuals adapt to difficult life experiences. The insight that can

be gained by exploring student adjustment was further emphasised by the fact that the

content analysis revealed substantial detail on how students go about finding meaning

in their attempt to adapt.

These analyses showed that meaning as comprehensibility was associated with

its own unique variety of themes such as developing a deeper self-awareness

"University has made me realise how much I depend on my mum and how much I

miss her and rely on her to make me feel better/stop worrying" while meaning as

significance was associated with a different unique variety of themes such as

developing new skills "I am more confident in approaching people and igniting a

relevant relationship with whoever it is with". These differences aligned with

previous assertions that the two forms of meaning making exerted their impact in

distinct ways: (1) meaning as comprehensibility influenced adjustment by fitting the

event into existing schema about the justness, predictability and comprehensiveness

of the world and (2) meaning as significance influenced adjustment by increasing

positive views about the experiences and maintaining the belief that life has a

purpose (Janoff-Bulman & Frantz, 1994). As can be seen in the previous example

given for meaning as comprehensibility, the student is attempting to fit their

university experience into an understanding of his/her past life (comprehensiveness).

Similarly, in the example given for meaning as significance, the student is emphasizing the purpose behind university life (the increase in confidence). Only two previous content analyses exist which uncovered a similar variety of themes within populations adapting to a variety of experiences such as bereavement (Davis et al., 1998; Holland et al., 2006) and parenting children of Asperger's syndrome (Pakenham et al., 2004). These findings therefore further highlight the importance of exploring the influence of finding meaning to adaptation by exploring students adjusting university life.

In addition, the current results revealed that negative trait emotion exerted its impact on whether or not students find meaning in their university lives through students' thinking styles. This supports the need to understand the mechanisms through which personality traits exert their impact. This was first proposed in Cantor (1990), who argued that the trend of linking personality traits to behaviour had limited benefit; instead she claimed researchers needed to specify the cognitive processes through which the various traits exerted their impact. The results specifically highlight the importance of exploring how different cognitive processes may interact to influence adjustment. Research typically focuses on one main cognitive process such as optimistic thinking (Schok et al., 2010) with limited findings examining how different forms of thinking may interact to exert their impact (Davis et al., 1998). This suggests that future research should be performed in this area.

9.1.3.2.   *Practical Implications*

The findings highlight certain necessary aspects for any programme tackling student adjustment. Primarily, they suggest the need to consider personality traits that may impact the effectiveness of any programme that has been developed. In line with this, research has implicated an exhaustive list of personality traits as influencing individuals' levels of resilience (Bonanno, 2004; Fine, 1991; Raes, 2010). However, programmes that have been proposed rarely consider how students' existing personality differences may promote or hinder the effectiveness of the programme on student adjustment. For example, research has proposed a wide range of interventions targeting students' capacity to be grateful (Emmons & Stern, 2013) and flexible (Bonanno, Papa, O'Neill, Westphal & Coifman, 2004) yet these studies have not considered the degree to which these programmes may be influenced by existing individual differences. Given the influence of personality traits on individuals' levels of resilience as indicated in the current thesis, future research should consider exploring how these traits influence the effectiveness of proposed programmes on student adjustment.

The current assessment further highlights how these personality traits may exert their impact – through students' negative and positive thinking styles which influence whether they find meaning as comprehensibility and meaning as significance in their university lives respectively. The role of negative and positive thinking on adjustment has previously emerged in studies into other populations (Segerstrom et al., 2003; Davis et al., 1998; Schok et al., 2010; Watkins, 2008). However, within the student population, findings suggested that these two dimensions of thinking styles

may not in fact exert a significant direct impact. Instead, as discussed in Chapter 2, prior empirical work suggested that it was the complexity of students' negative and positive thinking styles that impacted whether or not they adjusted to university life.

In line with these findings, the present studies (Chapters 3 and 4) revealed that students' negative and positive thinking styles did not fully explain the impact of negative trait emotion on students' levels of resilience. However, contrary to prior results, this was found not to be due to the complexity of these thinking styles (Chapter 6), but rather to the impact they had on whether or not students were able to find meaning in their university lives (Chapter 8). These results suggest that programmes should explore whether this interaction is associated with other personality traits. Do all students who have difficulty adjusting to university life have increased negative thinking styles and reduced positive thinking styles that impact their capacity to find meaning as comprehensibility and meaning as significance in their university lives?

9.2. Strengths and Limitations

The results that emerged in the current thesis suggest that negative trait emotion influences student adjustment in two main ways: (1) through increased negative thinking styles which prevent students from finding meaning as comprehensibility in their university lives and (2) decreased positive thinking styles which prevent students from finding meaning as significance in their university lives. However, the strengths and limitations need to be considered. A brief review of these is presented below.

9.2.1.   Strengths

The studies performed in this thesis presented the first known attempt to explore how cognitive processes interact to influence how a specific personality trait – negative trait emotion – influences student adjustment to university life. As previously discussed it implemented several original steps in order to fill several gaps in the literature. In doing so, aspects of the methods used such as the integration of valid measures and robust analytical procedures presented a systematic analysis that increased confidence in the results obtained. These are discussed below.

9.2.1.1.   Participants

The participants within the various studies of the current thesis were undergraduate students attending the University of York. This was considered an ideal population for two key reasons: (1) the main aim of the research was to evaluate student adjustment to university life and (2) participants were easily accessible as the research was associated with the Psychology Department within this University.

Furthermore, for each study, a representative sample of the undergraduate student population within the university was obtained. This is evidenced by the fact that the majority of students within all samples were British students with lesser numbers of non-UK Europeans and those domiciled outside of the UK. The distribution is similar to the details given for undergraduate admissions at the start of the current thesis (University of York, 2011). This suggests that the population should be seen as providing an efficient platform for evaluating how students adjust to university life within the University of York. In addition, however, other

universities within the United Kingdom also put forth similar undergraduate

admission statistics. For instance, in 2012/2013, the University of Cambridge

welcomed 78.3% British students with smaller percentages of non-UK Europeans

and those domiciled outside of the UK (University of Cambridge, 2012). In addition,

many of the studies within the current thesis were based on large sample sizes,

adding to the confidence that can be placed in the generalizability of the findings.

Therefore, it can be argued that the results may be valid to understanding student

adjustment within the University of York and other universities in the United

Kingdom.

9.2.1.2.   Materials and apparatus

Although many of the measures utilised in the current work had previously

been validated in similar undergraduate populations, some measures had not. These

included the Linguistic Inquiry and Word Count scales used to assess complex

thinking and the content analyses used to evaluate the different categories of finding

meaning. However, these instruments had been utilised in several studies within the

literature that explored adjustment to other events such as bereavement and emerged

with high levels of reliability (Davis et al., 1998; Pennebaker, Mayne & Francis,

1997; Pakenham, 2004). In addition, within the current study, both measures had high

reliability. This suggests that they provided an efficient assessment of complex

thinking and finding meaning respectively.

Furthermore, the thesis attempted to examine the wider, overarching negative

and positive thinking patterns that were intimated in previous studies (Siegle et al.,

2004; Watkins, 2008). The general negative thinking style was evaluated by assessing students' levels of rumination, while the broader positive thinking style was evaluated by assessing students' levels of optimistic thinking. These measures were chosen because rumination and optimistic thinking are two of the most frequently evaluated thinking patterns (Carver et al., 1993; Litt et al., 1992; Alloy et al., 2006; Lyubomirsky & Nolen-Hoeksema, 1995; Nolen-Hoeksema, 2000; Robinson & Alloy, 2003; Schok et al., 2010) and have emerged as significantly related to the other measures of negative and positive thinking respectively (Bryant, 2003; Nolen-Hoeksema et al., 2008; Siegle et al., 2004; Watkins, 2008). Their use within the thesis provides a more systematic evaluation of students' negative and positive thinking styles.

Several original measures were also employed in order to provide more robust assessments. For instance, an innovative method was used to assess maladaptive automatic cognitive appraisals – participants' responses to video stimuli. Videos have been previously used to evaluate cognitive appraisals in the literature (Hazebroek et al., 2001) due to them being an ideal way of understanding the details involved in individuals' cognitive appraisals. Within the current thesis, a larger variety of videos were selected. These comprised a random selection of events ranging in emotional severity. For instance, one of the videos labelled 'low' displayed children eating; one of the videos labelled 'medium' displayed a waiter spilling a man's coffee and one of the videos labelled 'high' showed an ambulance stuck in traffic. These labels were derived through a standardisation procedure using a small sample of participants (see

Chapter 3). These adjustments enabled the development of a better measure of the automatic cognitive appraisals that were being made.

In addition, single-item measures are typically used to evaluate meaning as comprehensibility ("Do you feel you have been able to make sense of the experience?") and meaning as significance ("Have you found anything positive in this experience?"). However, in the current thesis (Chapters 7 and 8), meaning making was evaluated using students' streams-of-consciousness in which they wrote their thoughts about their university lives thus far. The instructions for the task were adapted from Pennebaker and King (1999, p. 1301-1302). This method allowed students' to express themselves freely – a procedure referred to by Singer (2004) as narratives. It was chosen because according to Singer (2004), it tapped into participants' "life story schema" where the meanings they give to their experiences are stored (p. 442). He suggests that meaning can be effectively assessed by allowing individuals to write openly on the content of this "life story schema" (the narrative procedure). The use of this procedure thus increased confidence in the findings obtained as, in accordance with Singer's arguments, it enabled valuable insight into the content of students' meanings about university life. Furthermore, the alphas obtained for deciphering whether students had found meaning as comprehensibility and/or significance were all high (all alphas > 0.69), further increasing the validity of the results.

9.2.1.3.   Data analysis

The work presented in this thesis employed robust statistical analyses. For instance, path analysis was applied in Studies 2 and 5. According to researchers, path analysis renders the specification of multipart causal chains simple and "straightforward" (Kline, 2011, p. 106), and was thus ideal given the complicated three-path mediations being evaluated. Robust analyses were also present for the mediation and moderation assessments as these were performed using modified statistical programmes which provide several advantages as detailed in Chapters 3 and 6 respectively.

In addition, for every statistical method chosen, the data were evaluated against its assumptions. For instance, whenever path analysis was used (see Chapters 3, 4 and 8), the specifications included in the model being assessed were examined to ensure that they were "theoretically justifiable" (Kline, 2011, p. 106). Similarly, when the intended analyses involved mediation or moderation, the data were considered against the relevant assumptions while for the factor analysis, the results were validated using multiple checks including Cronbach alphas, MIs, standardised residuals, factor correlations and factor loadings.

In cases where the assumptions were broken, the necessary steps were taken to ensure that the most efficient assessment possible was still being performed. For example, throughout the thesis, the data were skewed as was anticipated based on the nonclinical nature of the sample. Therefore, bootstrapping was applied for every analysis. As discussed in Chapter 3, bootstrapping is recommended as the most efficient means of evaluating non-normal data (Field, 2009; 2013). Bootstrapping

operates by developing a sampling distribution of the parameters pertinent to the

analysis (in this case regression *b*s) using resamples from the data being analysed.

Several methods are available for producing these 95% CIs. The bias corrected and

accelerated method with 5,000 resamples was used. This procedure was chosen as it

is considered more conservative (Shrout & Bolger, 2002); therefore significant

results obtained using the bias and accelerated method suggests that these represent

genuine effects.

9.2.1.4.   Procedure

Online surveys were the main procedure used within the thesis. This was

deemed the most advantageous method of data collection for several reasons (Evans

& Mathur, 2005). Firstly, it made it easy to obtain the large sample sizes required for

the analyses. Secondly, the surveys were constructed in such a way as to force

participants to answer all the questions included in one measure before they could

continue to the next page. This minimised missing data. Thirdly, given the need for a

longitudinal analysis (see Chapter 7), it enabled the researcher to easily follow up

with students in Term 2 after the first data collection in Term 1.

The impact of meaning making was evaluated within a longitudinal study using

148 first-year students. This allowed for some understanding of the influence of

finding meaning as comprehensibility and meaning as significance on students' levels

of resilience. However, longitudinal analyses have several inherent disadvantages.

Primordial among these is that it may lead to samples that are not representative of

the wider population. As previously discussed, however, throughout the thesis,

representative samples were derived from the undergraduate student population

within the university. This suggests that the longitudinal study may nonetheless have

generated genuine results concerning the impact of meaning making.

9.2.2. Limitations

The thesis provided original contributions to the literature and incorporated

robust methods that add to the confidence that can be placed in the findings. However

several limitations exist which are discussed below.

9.2.2.1. *Participants*

The use of students within the University of York for all the analyses within the

thesis suggests that caution should be taken in generalizing the findings to other

universities outside of the United Kingdom. This is due to the presence of cultural

differences which may influence what factors impact adjustment to such universities.

Furthermore, the mean age of the sample within the studies of the thesis suggested

that the current results may only provide insight into adjustment within the younger

university population. Therefore, further research is needed to determine if, and to

what extent, do results differ among more mature university students.

9.2.2.2. *Materials and apparatus*

The benefits of the use of video stimuli as previously discussed were not

incorporated in the evaluation of positive cognitive appraisals. Instead, these

cognitive appraisals were assessed using the positive affect subscale of the Positive

and Negative Affect Schedule (PANAS-PA; Watson et al., 1988b). This measure was

incorporated primarily because little work has been performed to understand the

content of the subjective evaluations underlying positive cognitive appraisals.

Instead, the tendency to experience positive automatic cognitive appraisals has been

associated with increased scores in the PANAS-PA (Schneider et al., 1994).

Furthermore, the measure has obtained high alpha coefficients among university

student samples (ranging from 0.86 to 0.90) (Watson et al., 1988b). Hence, it was

deemed an adequate measure for positive automatic cognitive appraisals. Future

research should, however, attempt to evaluate positive cognitive appraisals using

video stimuli.

This is specifically recommended because self-report measures have been

criticised as influenced by social desirability which leads participants to report

reduced scores on negative items and increased scores on non-negative items (Chan,

2009). In addition to the PANAS-PA, students' levels of negative trait emotion,

negative thinking styles, positive cognitive appraisals and resilience were evaluated

using self-report measures. However, these have also previously emerged with high

external validity in studies within similar undergraduate populations. In addition,

within the current thesis, attempts were made to reduce the influence of social

desirability through the use of online surveys (Evans & Mathur, 2005). This thus may

have nonetheless increased validity of the findings.

9.2.2.3.   Data analysis

The most efficient evaluation of the final model (Chapter 8) would have been

obtained using longitudinal data where students' levels of trait inhibition, negative

and positive thinking styles in Term 1 were compared to whether or not they found meaning and their levels of resilience in Term 2. This temporal precedence would have increased the confidence that can be placed in the fit of the model. However, such data were only available for 148 first-year students. This sample was deemed to be too small to perform the intended complicated path analysis as the recommended minimal sample size for path analyses is 200 participants (Kline, 2011) and similar three-step models evaluated using path analyses within in this branch of the literature have typically used over 200 participants (Davis et al., 1998; Schok et al., 2010). Based on this, the cross-sectional data collected from the larger sample of 390 students was used.

However, it can be argued that confidence in the results of the path analysis should still be maintained as the relationships specified in the model were all substantiated by: (1) supporting theory as discussed in Chapter 8 and (2) previous empirical findings. Some of these findings include Davis et al. (1998) who found that optimistic thinking impacted whether or not recently-bereaved participants found meaning as significance in their loss and Holland et al. (2006) who found that discovering both meaning as comprehensibility and meaning as significance influenced adjustment to bereavement among university students.

9.2.2.4.   *Procedure*

Another limitation of the thesis is that many of its studies were cross-sectional in nature. Cross-sectional analyses limit the degree to which causal inferences can be made. However, as discussed in the previous Chapters, many of the findings have

also been highlighted in previous research. For instance, the results concerning the

impact of negative and positive thinking styles on adjustment have emerged in other

studies, some of which are longitudinal in nature (Davis et al., 1998; Schok et al.,

2010). This thus increases the validity of the current findings.

9.3. Future Directions

Based on the results, several areas in need of future research have been

highlighted. Many of these were previously discussed within this Chapter including:

(1)   explorations into the role played by high trait BIS (trait inhibition) on

student adjustment in other UK and non-UK university student

populations

(2)   investigations of whether other personality traits also influence student

adjustment through the impact of negative and positive thinking styles on

students' capacity to find meaning as comprehensibility and meaning as

significance in their university lives

(3)   assessments of how the influence of finding meaning as

comprehensibility and meaning as significance differ based on how

younger and older students adjust to university life

The findings additionally highlight the need for further research into the role of

resilience in student adjustment. The model was based on arguments that higher

levels of resilience enable adjustment to one's life experiences (Campbell-Sills et al.,

2006). This implies that it is important to focusing on building students' resilience in

order to improve student adjustment to university life. Such postulations have been

supported by researchers such as Stallman (2011) who emphasised the need to enhance student adjustment by incorporating resilience-building programmes into the tertiary education curriculum. She asserted that the existing programmes emphasised improving adjustment by reducing students' levels of distress. However, the rates of mental ill health and academic drop-out remain high within the university population (Stallman, 2010).

Therefore, Stallman recommends an alternative focus centred on building students' levels of resilience. In line with this, in order to shed light on what promotes student adjustment to university life, the current thesis developed and evaluated a model which explored how different factors interacted to influence students' levels of resilience. However, further research is needed to substantiate whether the proposed focus on building students' resilience using the highlighted factors actually improves student adjustment to university life.

In addition, 49.32 % of the variance in students' CD-RISC scores remained unexplained which suggested that other cognitive processes influencing student adjustment need to be explored such as positive self-regard (Mattanah, Hancock & Brand, 2004; Scott, Martin & Charles, 1991) and locus of control (Scott et al.,1991). The current work can thus be seen as a good preliminary analysis of the cognitive processes that may be involved in student adjustment. Future research can build on these in order to develop a deeper understanding of the cognitive processes impacting students' ability to adapt to university life.

9.4. Summary and Conclusions

This thesis set out to examine the cognitive processes that influence student adjustment to university life. It sought to compare the impact of: (1) cognitive processes that were automatic in nature to those that were longer-term and pervasive in nature (referred to as thinking styles) and (2) cognitive processes that were maladaptive (negative) in nature to those that were adaptive (positive) in nature. It also aimed to determine whether these cognitive processes exerted their impact by influencing how students made meaning of their university lives. In an attempt to explore how personality traits are cognitively expressed, and whether these cognitive expressions account for the impact of personality on resilience, the thesis compared the mediating impact of the aforementioned cognitive processes on the relationship between negative trait emotion and students' levels of resilience.

The findings of the current thesis have three main useful implications. Primarily, they suggest that the trait-congruent hypothesis may have limited applicability for understanding how cognitive processes may influence student adjustment. The trait-congruent hypothesis put forth by Rosenberg (1998) and promulgated by several researchers (e.g. Parrot et al., 2005) suggested that negative trait emotion exerted its influence through trait-congruent cognitive processes. However, the current findings showed that the cognitive processes influencing student adjustment to university life may be more related to the behavioural activation and behavioural inhibition systems put forth by Gray (1991). On the one hand, these results bolster prior research which has similarly aligned the BAS and BIS with distinct patterns of cognitive activation (a mental focus on cues of reward)

and cognitive inhibition (cognitive avoidance of expressing thoughts and feelings concerning life experiences) respectively (Pennebaker, 1985; Matthys et al., 1998). On the other hand, however, the findings associate the trait-congruent hypothesis with automatic cognitive processes, and this has also been found in empirical work (Mogg et al., 1994; Parrot et al., 2005; Wilkowski et al., 2008). Therefore, an alternative explanation may be that it clarified existing literature, showing that while the trait-congruent hypothesis may explain automatic cognitive processes, it may not be extended to explain the longer term cognitive processes that exist.

The second conclusion that can be drawn from the findings of the current thesis concerns the role played by trait inhibition and longer term thinking styles on student adjustment to life at the University of York. The results showed that trait inhibition and longer-term cognitive processes exerted a superior impact on how students adjust to university life while trait activation and automatic cognitive processes did not. The role of the BIS and its associated cognitive and behavioural inhibition on adjustment has been highlighted in prior research (Field et al., 2001; O'Connor & Forgan, 2007). These researchers linked heightened BIS activity to suicidal thinking and depression, thus supporting the current results. In addition, longer term maladaptive thinking styles have been linked to a range of poor adaptation outcomes (Fredrickson, 2001; Kocovski et al., 2005), further bolstering the findings. The results concerning trait activation and automatic cognitive processes also validate previous research where these two variables have been linked to the more impulsive behaviour that is unrelated to resilience (Matthys et al., 1998; Rutter, 2007; Wilkowski et al., 2008), ().

These findings highlight the need for universities to improve student adjustment in two ways:

(1) through seeking out students who engage in behavioural inhibition (actively inhibit their behaviour) for example by using the trait inhibition measure as a screening tool. Such behaviour has been linked to having high levels of trait BIS and may thus highlight students who are more prone to poor adjustment

(2) through seeking out students who may engage in cognitive inhibition (avoid expressing their thoughts and feelings) or may possess increased negative thinking styles and reduced positive thinking styles as these thinking patterns may also signal students who also are prone to poor adjustment

The third and final implication of the current findings involves the role of meaning making on student adjustment. The results showed that longer-term cognitive processes exerted a superior impact on how students adjust to university life by influencing how they made meaning of being at university in two ways: (1) maladaptive (negative) thinking styles influenced whether students were able to find meaning as comprehensibility in their university lives and (2) adaptive (positive) thinking styles influenced whether students were able to find meaning as significance in their university lives. The significant impact of finding meaning suggests that entering university may be a similarly intense experience as war (Schok et al., 2010) or bereavement (Holland et al., 2006). This highlights the need to develop programmes which aim to help students adapt to their university experiences (Jackson et al., 2000; Stallman, 2011). Furthermore, however, these findings support

one of the main aims of the thesis: to emphasise the importance of exploring

resilience as a process and understanding the mechanisms which underlie this

process. It showed that personality (evaluated with the specific trait of negative trait

emotion) does in fact exert its impact on resilience through cognitive processes as

espoused by proponents within the field (Flach, 1990; Fine, 1991).

In summary, therefore, based on the valid measures and robust analyses used, it

is suggested that adjustment among students high on negative trait emotion (students

more prone to experiencing difficulties adjusting to university) may most effectively

be promoted by increasing their levels of positive thinking and reducing their levels

of negative thinking while guiding them to find meaning as comprehensibility and

meaning as significance in their university lives. However, in light of the limitations

present, future research is warranted which: (1) explores the role of trait inhibition on

student adjustment, (2) examines whether the relationship between negative and

positive thinking styles and finding meaning can be replicated among other student

populations and when assessing the influence of other personality traits on student

adjustment to university life and (3) evaluates what other cognitive processes may

influence students' levels of resilience as they adjust to university life.

Appendices

Appendix A

Materials and apparatus

Appendix A1

Trait anger subscale of the State-Trait Anger Expression Inventory-2

(Spielberger, 1999)

Instructions

Read each of the following statements that people have used to describe themselves, and then select the appropriate answer to indicate how you generally feel or react. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to best describe how you generally feel or react.

	Almost never	Sometimes	Often	Almost always
I am quick tempered	1	2	3	4
I have a fiery temper	1	2	3	4
I am a hot-headed person	1	2	3	4
I get angry when I'm slowed down by others	1	2	3	4
I feel annoyed when I am not given recognition for doing good work	1	2	3	4
I fly off the handle	1	2	3	4
When I get mad, I say nasty things	1	2	3	4
It makes me furious when I am criticized in front of others	1	2	3	4

When I get frustrated, I feel like hitting someone	1	2	3	4
I feel infuriated when I do a good job and get a poor evaluation	1	2	3	4

Appendix A2

Trait anxiety subscale of the State-Trait Anxiety Inventory (Spielberger, Gorsuch, Lushene, Vagg & Jacobs, 1983)

Instructions

A number of statements which people have used to describe themselves are given below. Read each statement and then select the appropriate value to the right of the statement to indicate how you generally feel. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to best describe how you generally feel.

	Almost never	Sometimes	Often	Almost always
I feel pleasant	1	2	3	4
I feel nervous and restless	1	2	3	4
I feel satisfied with myself	1	2	3	4
I wish I could be as happy as others seem to be	1	2	3	4
I feel like a failure	1	2	3	4
I feel rested	1	2	3	4
I am 'calm, cool and collected'	1	2	3	4
I feel that difficulties are piling up so that I cannot overcome them	1	2	3	4
I worry too much over something that generally doesn't matter	1	2	3	4

I am happy	1	2	3	4
I have disturbing thoughts	1	2	3	4
I lack self-confidence	1	2	3	4
I feel secure	1	2	3	4
I make decisions easily	1	2	3	4
I feel inadequate	1	2	3	4
I am content	1	2	3	4
Some unimportant thought runs through my mind and bothers me	1	2	3	4
I take disappointments so keenly that I can't put them out of my mind	1	2	3	4
I am a steady person	1	2	3	4
I get in a state of tension or turmoil as I think over my recent concerns	1	2	3	4
I feel nervous and restless	1	2	3	4
I wish I could be as happy as others seem to be	1	2	3	4
I feel like a failure	1	2	3	4

Appendix A3

Trait depression subscale of the State-Trait Personality Inventory (Spielberger, Reheiser, & Sydeman, 1995)

Instructions

A number of statements which people have used to describe themselves are given below. Read each statement and then select the appropriate choice to the right of the statements to indicate how you generally feel. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to best describe how you generally feel.

	Almost never	Sometimes	Often	Almost always
I feel gloomy	1	2	3	4
I feel happy	1	2	3	4
I feel depressed	1	2	3	4
I feel sad	1	2	3	4
I feel hopeless	1	2	3	4
I feel low	1	2	3	4
I feel whole	1	2	3	4
I feel safe	1	2	3	4
I feel peaceful	1	2	3	4
I enjoy life	1	2	3	4

Appendix A4

The Rehearsal subscale of the Emotion Control Questionnaire II (Roger &

Najarian, 1989)

Instructions

Please indicate how you feel about each item by circling either 'TRUE' or 'FALSE'. If you feel that the item is neither entirely true nor false, please choose the alternative that is <u>most</u> like you. If you haven't been in the situation described, please say how you feel you would behave in that situation.

I remember things that upset me or make me angry for a long time afterwards	TRUE	FALSE
I generally don't bear a grudge - when something is over, it's over, and I don't think about it again	TRUE	FALSE
I get 'worked up' just thinking about things that have upset me in the past	TRUE	FALSE
I often find myself thinking over and over about things that have made me angry	TRUE	FALSE
I can usually settle things quickly and be friendly again after an argument	TRUE	FALSE
If I see or hear about an accident, I find myself thinking about something similar happening to me or to people close to me	TRUE	FALSE
I think about ways of getting back at people who have made me angry long after the event has happened	TRUE	FALSE
I never forget people making me angry long after the	TRUE	FALSE

event has happened

I find it hard to get thoughts about things that have upset me out of my mind	TRUE	FALSE
I often daydream about situations where I'm getting my own back at people	TRUE	FALSE
If I see something that frightens or upsets me, the image of it stays in my mind for a long time afterwards	TRUE	FALSE
Thinking about upsetting things just seems to keep them going, so I try to put them out of my mind	TRUE	FALSE
If I lose out on something, I get over it quickly	TRUE	FALSE
If I have to confront someone, I try not to think too much about it beforehand	TRUE	FALSE

Appendix A5

Connor-Davidson Resilience Scale (Connor & Davidson, 2003)

Instructions

For each item, please select the option below that best indicates how much you agree with the following statements as they apply to you over the last month. If a particular situation has not occurred recently, answer according to how you think you would have felt.

	Not true at all	Rarely true	Sometimes true	Often true	True nearly all the time
I am able to adapt when changes occur	1	2	3	4	5
I have at least one close and secure relationship that helps me when I am stressed	1	2	3	4	5
When there are no clear solutions to my problems, sometimes fate or God can help	1	2	3	4	5
I can deal with whatever comes my way	1	2	3	4	5
Past successes give me confidence in dealing with new challenges and difficulties	1	2	3	4	5

I try to see the humorous side of things when I am faced with problems	1	2	3	4	5
Having to cope with stress can make me stronger	1	2	3	4	5
I tend to bounce back after illness, injury or other hardship	1	2	3	4	5
Good or bad, I believe that most things happen for a reason	1	2	3	4	5
I give my best effort no matter what the outcome may be	1	2	3	4	5
I believe I can achieve my goals, even if there are obstacles	1	2	3	4	5
Even when things look hopeless, I don't give up	1	2	3	4	5
During times of stress/crisis, I know where to turn for help	1	2	3	4	5
Under pressure, I stay focused and think clearly	1	2	3	4	5
I prefer to take the lead in solving problems rather than letting others make all the decisions	1	2	3	4	5
I am not easily discouraged by failure	1	2	3	4	5

I think of myself as a strong person when dealing with life's challenges and difficulties	1	2	3	4	5
I can make unpopular decisions that affect other people, if necessary	1	2	3	4	5
I am able to handle unpleasant or painful feelings like sadness, fear, and anger	1	2	3	4	5
In dealing with life's problems, sometimes you have to act on a hunch without knowing why	1	2	3	4	5
I have a strong sense of purpose in life	1	2	3	4	5
I feel in control of my life	1	2	3	4	5
I like challenges	1	2	3	4	5
I work to attain my goals no matter what roadblocks I encounter along the way	1	2	3	4	5
I take pride in my achievements	1	2	3	4	5

Appendix A6

The Rehearsal subscale of the Emotion Control Questionnaire III (Roger, Guarino de Scremin; Borril & Forbes, 2011)

Instructions

Indicate how you feel about each item by selecting either 'True' or 'False'. If an item is neither entirely true nor false, choose the alternative most like you. If you haven't been in the situation, please say how you feel you would behave in that situation.

I remember things that upset me or make me angry for a long time afterwards	TRUE	FALSE
I don't bear a grudge – when something is over, it's over, and I don't think about it again	TRUE	FALSE
I get worked up just thinking about things that have upset me in the past	TRUE	FALSE
I often find myself thinking over and over about things that make me angry	TRUE	FALSE
I seldom get preoccupied with worries about my future	TRUE	FALSE
If I see something that frightens or upsets me, it stays in my mind for a long time afterwards	TRUE	FALSE
My failures give me a persistent feeling of remorse	TRUE	FALSE
For me, the future seems to be full of troubles and problems	TRUE	FALSE
I often feel as if I'm just waiting for something bad to happen	TRUE	FALSE
When I am reminded of my past failures, I feel as if they are	TRUE	FALSE

happening all over again

Sometimes I have to force myself to concentrate on something else to keep distressing thoughts about the future out of my mind	TRUE	FALSE
Intrusive thoughts about problems I'm going to have to deal with make it difficult for me to keep my mind on a task	TRUE	FALSE
I don't let a lot of unimportant things irritate me	TRUE	FALSE
I wish I could banish from my mind the memories of past failures	TRUE	FALSE
I never get so involved thinking about upsetting things that I am unable to feel positive about the future	TRUE	FALSE
I worry less about what might happen than most people I know	TRUE	FALSE
It takes me a comparatively short time to get over unpleasant events	TRUE	FALSE
Any reminder about upsetting things brings all the emotion flooding back	TRUE	FALSE

Appendix A7

The Worry Domains Questionnaire (Tallis, Eysenck, & Mathews, 1992)

Instructions

Please select an appropriate answer to show how much you worry about the following:

	Not at all	A little	Moderately	Quite a bit	Extremely
I worry that I will lose close friends	1	2	3	4	5
I worry that I am unattractive to the opposite sex	1	2	3	4	5
I worry that my family will be angry with me or disapprove of something that I do	1	2	3	4	5
I worry that I find it difficult to maintain a stable relationship	1	2	3	4	5
I worry that I am not loved	1	2	3	4	5
I worry that I cannot be assertive or express my opinions	1	2	3	4	5
I worry that others will not approve of me	1	2	3	4	5

I worry that I lack confidence	1	2	3	4	5
I worry that I might make myself look stupid	1	2	3	4	5
I worry that I feel insecure	1	2	3	4	5
I worry that I'll never achieve my ambitions	1	2	3	4	5
I worry that I haven't achieved much	1	2	3	4	5
I worry that my future job prospects are not good	1	2	3	4	5
I worry that life may have no purpose	1	2	3	4	5
I worry that I have no concentration	1	2	3	4	5
I worry that I will be late for an appointment	1	2	3	4	5
I worry that I leave work unfinished	1	2	3	4	5
I worry that I make mistakes at work	1	2	3	4	5
I worry that I don't work hard enough	1	2	3	4	5
I worry that I will not keep my workload up-to-date	1	2	3	4	5
I worry that my money will run out	1	2	3	4	5
I worry that I am not able to afford things	1	2	3	4	5

I worry that financial problems will restrict holidays and travel	1	2	3	4	5
I worry that my living conditions are inadequate	1	2	3	4	5
I worry that I can't afford to pay bills	1	2	3	4	5

Appendix A8

The Positive and Negative Affect Schedule (Watson, Clark & Tellegen, 1988)

Instructions

This scale consists of a number of words that describe different feelings and emotions. Read each item and then list the number from the scale below next to each word. Indicate to what extent you feel this way over the past month.

	Very slightly or not at all	A little	Moderately	Quite a bit	Extremely
Interested	1	2	3	4	5
Excited	1	2	3	4	5
Strong	1	2	3	4	5
Enthusiastic	1	2	3	4	5
Proud	1	2	3	4	5
Alert	1	2	3	4	5
Inspired	1	2	3	4	5
Determined	1	2	3	4	5
Attentive	1	2	3	4	5
Active	1	2	3	4	5

Appendix A9

The Life Orientation Test–Revised (Scheier, Carver, & Bridges, 1994)

Instructions

Please be as honest and accurate as you can throughout. Try not to let your response to one statement influence your responses to other statements. There are no 'correct' or 'incorrect' answers. Answer according to your own feelings, rather than how you think 'most people' would answer.

	I agree a lot	I agree a little	I neither agree nor disagree	I disagree a little	I disagree a lot
In uncertain times, I usually expect the best	1	2	3	4	5
It is easy for me to relax	1	2	3	4	5
If something can go wrong for me, it will	1	2	3	4	5
I'm always optimistic about my future	1	2	3	4	5
I enjoy my friends a lot	1	2	3	4	5
It's important for me to keep busy	1	2	3	4	5
I hardly ever expect things to go my way	1	2	3	4	5
I don't get upset too easily	1	2	3	4	5
I rarely count on good things happening to me	1	2	3	4	5

Overall. I expect more good things to happen to me than bad	1	2	3	4	5

Appendix A10

The Savouring Beliefs Inventory (Bryant, 2003)

Instructions

For each statement listed below, please select the option that best indicates how true the particular statement is for you. There are no right or wrong answers. Please be as honest as you can.

	Strongly agree						Strongly disagree
Before a good thing happens, I look forward to it in ways that give me pleasure in the present	1	2	3	4	5	6	7
It's hard for me to hang onto a good feeling for a long time	1	2	3	4	5	6	7
I enjoy looking back on happy times from my past	1	2	3	4	5	6	7
I don't like to look forward to good times too much before they happen	1	2	3	4	5	6	7
I know how to make the most of a good time	1	2	3	4	5	6	7
I don't like to look back at good times too much after	1	2	3	4	5	6	7

they've taken place

| I feel a joy of anticipation when I think about upcoming good things | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

| When it comes to enjoying myself, I'm my own 'worst enemy' | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

| I can make myself feel good by remembering pleasant events from my past | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

| For me, anticipating what upcoming good events will be like is basically a waste of time | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

| When something good happens, I can make my enjoyment of it last longer by thinking or doing certain things | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

| When I reminisce about pleasant memories, I often start to feel sad or disappointed | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

| I can enjoy pleasant events in my mind before they actually occur | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

| I can't seem to capture the joy of happy moments | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

I like to store memories of fun times that I go through so that I can recall them later	1	2	3	4	5	6	7
It's hard for me to get very excited about fun times before they actually take place	1	2	3	4	5	6	7
I feel fully able to appreciate good things that happen to me	1	2	3	4	5	6	7
I find that thinking about good times from the past is basically a waste of time	1	2	3	4	5	6	7
I can make myself feel good by imagining what a happy time that is about to happen will be like	1	2	3	4	5	6	7
I don't enjoy things as much as I should	1	2	3	4	5	6	7
It's easy for me to rekindle the joy of pleasant memories	1	2	3	4	5	6	7
When I think about a pleasant event before it happens, I often start to feel uneasy or uncomfortable	1	2	3	4	5	6	7
It's easy for me to enjoy myself when I want to	1	2	3	4	5	6	7
For me, once a fun time is over and gone, it's best not to think about it	1	2	3	4	5	6	7

Appendix B

Demographic analyses from Study 1

Gender differences. Mann-Whitney U tests of gender on trait anger, trait anger, trait anxiety, trait depression, automatic cognitive appraisals (emotion ratings), rumination and resilience revealed no significant gender differences.

Demographic variable	Dependent variable	Test statistic	p
Gender	Trait anger	2,021.00	.249
Gender	Trait anxiety	2,180.50	.057
Gender	Trait depression	1,828.50	.882
Gender	Average anger ratings	1,744.50	.773
Gender	Average anxiety ratings	2,002.50	.292
Gender	Average sadness ratings	1,900.50	.601
Gender	Rumination	2,024.00	.241
Gender	Resilience	1,585.00	.263

Ethnicity differences. Kruskall-Wallis tests of ethnicity on trait anger, trait anger, trait anxiety, trait depression, automatic cognitive appraisals (emotion ratings), rumination and resilience revealed no significant differences.

Demographic variable	Dependent variable	Test statistic	p
Ethnicity	Trait anger	9.18	.327
Ethnicity	Average anger ratings	15.39	.052
Ethnicity	Trait anxiety	6.12	.633
Ethnicity	Average anxiety ratings	3.97	.860
Ethnicity	Trait depression	11.40	.180
Ethnicity	Average sadness ratings	11.59	.171
Ethnicity	Rumination	2.66	.954
Ethnicity	Resilience	4.28	.831

Appendix C

Demographic analyses from Study 3

Gender differences. Mann-Whitney U tests of gender on trait anger, trait anger, trait anxiety, trait depression, worry, rumination and resilience revealed no significant gender differences.

Demographic variable	Dependent variable	Test statistic	p
Gender	Trait anger	4,129.00	.700
Gender	Trait anxiety	4,167.00	.631
Gender	Trait depression	3,695.00	.475
Gender	Worry	4,113.50	.730
Gender	Rumination	3,871.50	.773
Gender	Resilience	4,229.50	.523

Ethnicity differences. Kruskall-Wallis tests were performed to explore the influence

of ethnicity on trait anger, trait anger, trait anxiety, trait depression, worry,

rumination and resilience. White American students had significantly higher levels

of resilience than Asian British students, H (7) = -3.25, p=.032. However, no

significant relationships emerged for the other variables.

Demographic variable	Dependent variable	Test statistic	p
Ethnicity	Trait anger	3.68	.816
Ethnicity	Trait anxiety	9.60	.212
Ethnicity	Trait depression	6.96	.434
Ethnicity	Worry	5.05	.654
Ethnicity	Rumination	8.70	.275
Ethnicity	Resilience	23.49	.001

Appendix D

The two-factor solution from the orthogonal rotation

Item	Factor loadings	
	Factor 1	Factor 2
I feel peaceful*	0.77	
I feel happy*	0.77	
I am content*	0.77	
I am happy*	0.76	
I enjoy life*	0.75	
I feel secure*	0.74	
I feel satisfied with myself*	0.72	
I feel whole*	0.72	
I feel pleasant*	0.68	
I feel like a failure	0.68	
I wish I could be as happy as others seem to be	0.66	
I feel depressed	0.64	0.34
I feel hopeless	0.64	0.35
I feel low	0.63	
I feel inadequate	0.63	
I feel gloomy	0.63	0.31
I feel safe*	0.62	
I lack self-confidence	0.59	
I am a steady person*	0.59	
I feel sad	0.56	0.33
I take disappointments so keenly that I can't put them out of my mind	0.55	0.36
I get in a state of tension or turmoil as I think over my recent concerns	0.55	0.40

I feel that difficulties are piling up so that I cannot overcome them	0.54	
I feel rested*	0.50	
I worry too much over something that really doesn't matter	0.49	0.34
I am "calm, cool and collected" *	0.47	
I feel nervous and restless	0.47	0.35
Some unimportant thought runs through my mind and bothers me	0.45	0.32
I have disturbing thoughts	0.44	0.35
I make decisions easily*	0.41	
I am a hot-headed person		0.78
I am quick tempered		0.73
I have a fiery temper		0.69
I fly off the handle		0.69
It makes me furious when I am criticized in front of others		0.58
I get angry when I'm slowed down by others' mistakes		0.57
I feel annoyed when I am not given recognition for doing good work		0.52
I feel infuriated when I do a good job and get a poor evaluation		0.50
When I get mad, I say nasty things		
When I get frustrated, I feel like hitting someone		

Note. * Items are reverse-scored

Appendix E

The four-factor solution from the orthogonal rotation

Item	Factor loadings			
	Factor 1	Factor 2	Factor 3	Factor 4
I feel depressed	0.73			-0.31
I feel hopeless	0.73			
I am happy*	0.72			
I feel happy*	0.71			
I wish I could be as happy as others seem to be	0.71			
I am content*	0.71			
I feel secure*	0.71			
I enjoy life*	0.70			
I feel gloomy	0.70			
I feel low	0.70			
I feel like a failure	0.70			
I feel peaceful*	0.68	-0.37		
I feel whole*	0.68			
I feel satisfied with myself*	0.67			

I get in a state of tension or turmoil as I think over my recent concerns	0.66			
I feel sad	0.65			-0.33
I feel inadequate	0.65			
I take disappointments so keenly that I can't put them out of my mind	0.64			
I feel pleasant*	0.64			
I am a steady person*	0.64			
I feel safe*	0.61			
I lack self-confidence	0.61			0.30
I feel that difficulties are piling up so that I cannot overcome them	0.61			
I worry too much over something that really doesn't matter	0.59			
I feel nervous and restless	0.56			
I have disturbing thoughts	0.54			
Some unimportant thought runs through my mind and bothers me	0.54		-0.34	
I feel rested*	0.50			
I am "calm, cool and collected" *	0.49			0.42
I make decisions easily*	0.40			
I am a hot-headed person	0.31	0.75	0.33	

I am quick tempered		0.69	
I have a fiery temper	0.31	0.66	0.39
I fly off the handle	0.39	0.58	
I get angry when I'm slowed down by others' mistakes		0.52	
It makes me furious when I am criticized in front of others	0.37	0.46	
I feel annoyed when I am not given recognition for doing good work	0.35	0.41	
I feel infuriated when I do a good job and get a poor evaluation	0.32	0.40	
When I get mad, I say nasty things			
When I get frustrated, I feel like hitting someone			

Note. * Items are reverse-scored

Appendix F

The single factor solution from the orthogonal rotation

Item	Factor loadings
	Factor 1
I feel hopeless	0.73
I feel depressed	0.73
I am happy*	0.72
I wish I could be as happy as others seem to be	0.72
I feel happy*	0.71
I am content*	0.71
I feel secure*	0.71
I feel gloomy	0.70
I enjoy life*	0.70
I feel like a failure	0.70
I feel low	0.69
I feel peaceful*	0.68
I feel whole*	0.68
I feel satisfied with myself*	0.67
I get in a state of tension or turmoil as I think over my recent concerns	0.66
I feel inadequate	0.65
I feel sad	0.65
I take disappointments so keenly that I can't put them out of my mind	0.64
I feel pleasant*	0.64
I am a steady person*	0.63
I feel safe*	0.61
I lack self-confidence	0.61
I feel that difficulties are piling up so that I cannot overcome them	0.61
I worry too much over something that really doesn't matter	0.59
I feel nervous and restless	0.56

I have disturbing thoughts	0.54
Some unimportant thought runs through my mind and bothers me	0.54
I feel rested*	0.50
I am "calm, cool and collected"*	0.48
I make decisions easily*	0.40
I fly off the handle	0.37
It makes me furious when I am criticized in front of others	0.36
I feel annoyed when I am not given recognition for doing good work	0.35
I feel infuriated when I do a good job and get a poor evaluation	0.32
I am a hot-headed person	
I have a fiery temper	
I am quick tempered	
I get angry when I'm slowed down by others' mistakes	
When I get mad, I say nasty things	
When I get frustrated, I feel like hitting someone	

Note. * Items are reverse-scored

Appendix G

The two-factor solution from the oblique rotation

Item	Factor loadings	
	Factor 1	Factor 2
I feel peaceful*	0.82	
I feel happy*	0.81	
I am content*	0.81	
I am happy*	0.79	
I enjoy life*	0.79	
I feel secure*	0.77	
I feel satisfied with myself*	0.75	
I feel whole*	0.75	
I feel pleasant*	0.71	
I feel like a failure	0.69	
I wish I could be as happy as others seem to be	0.66	
I feel safe*	0.64	
I feel inadequate	0.64	
I feel depressed	0.64	
I feel hopeless	0.63	
I feel low	0.63	
I feel gloomy	0.62	
I lack self-confidence	0.60	
I am a steady person*	0.60	
I feel sad	0.55	
I take disappointments so keenly that I can't put them out of my mind	0.53	
I feel that difficulties are piling up so that I cannot overcome them	0.53	

I get in a state of tension or turmoil as I think over my recent concerns	0.53	
I feel rested*	0.52	
I am "calm, cool and collected"*	0.48	
I worry too much over something that really doesn't matter	0.48	
I feel nervous and restless	0.45	
Some unimportant thought runs through my mind and bothers me	0.44	
I make decisions easily*	0.43	
I have disturbing thoughts	0.42	
I am a hot-headed person		0.81
I am quick tempered		0.75
I have a fiery temper		0.70
I fly off the handle		0.68
I get angry when I'm slowed down by others' mistakes		0.59
It makes me furious when I am criticized in front of others		0.56
I feel annoyed when I am not given recognition for doing good work		0.50
I feel infuriated when I do a good job and get a poor evaluation		0.48
When I get mad, I say nasty things		
When I get frustrated, I feel like hitting someone		

Note. * Items are reverse-scored

Appendix H

The three factor solution from the orthogonal rotation

Item	Factor 1	Factor 2	Factor 3
I feel pleasant*	0.64		
I feel satisfied with myself*	0.67		
I feel rested*	0.50		
I am "calm, cool and collected"*	0.48		
I am happy*	0.72		
I feel secure*	0.71		
I make decisions easily*	0.40		
I am content*	0.71		
I am a steady person*	0.63		
I feel nervous and restless	0.56		
I wish I could be as happy as others seem to be	0.71		
I feel like a failure	0.69		
I feel that difficulties are piling up so that I cannot overcome them	0.61		
I worry too much over something that really doesn't matter	0.59		
I have disturbing thoughts	0.54		
I lack self-confidence	0.61		
I feel inadequate	0.65		
Some unimportant thought runs through my mind and bothers me	0.54		-0.35
I take disappointments so keenly that I can't put them out of my mind	0.64		
I get in a state of tension or turmoil as I think over my recent concerns	0.66		
I am quick tempered		0.69	

I have a fiery temper	0.31	0.65	0.39
I am a hot-headed person	0.31	0.75	0.34
I get angry when I'm slowed down by others' mistakes		0.52	
I feel annoyed when I am not given recognition for doing good work	0.35	0.41	
I fly off the handle	0.39	0.58	
It makes me furious when I am criticized in front of others	0.37	0.46	
I feel infuriated when I do a good job and get a poor evaluation	0.32	0.40	
When I get mad, I say nasty things			
When I get frustrated, I feel like hitting someone			
I feel happy*	0.72		
I feel whole*	0.68		
I feel safe*	0.61		
I feel peaceful*	0.68	-0.37	
I enjoy life*	0.70		
I feel gloomy	0.70		
I feel depressed	0.73		
I feel sad	0.65		
I feel hopeless	0.73		
I feel low	0.69		

Note. * Items are reverse-scored

Appendix I

Factor analysis of eleven of the Linguistic Inquiry and Word Count (LIWC) scales

Item	Factor loadings
Words longer than 6 letters	
Prepositions	
Conjunctions	
Cognitive processes	0.83
Insight words	0.43
Causal words	
Negations	
Discrepancies	
Tentatives	0.60
Inclusive words	
Exclusive words	0.60

Appendix J

Demographic analyses from Study 9

Gender differences. Mann-Whitney U tests of gender on trait activation, trait inhibition, rumination, optimistic thinking, complex thinking and resilience revealed no significant gender differences.

Demographic variable	Dependent variable	Test statistic	p
Gender	Trait activation	2,063.50	.260
Gender	Trait inhibition	2,313.50	.862
Gender	Rumination	2,066.50	.266
Gender	Optimistic thinking	2,340.50	.942
Gender	Complex thinking	2,240.00	.651
Gender	Resilience	2,680.00	.224

Ethnicity differences. Kruskall-Wallis tests were performed to explore the influence of ethnicity on trait activation, trait inhibiiton, rumination, optimistic thinking, complex thinking and resilience. Non-UK Europeans had significantly higher levels of resilience compared to White British students, $H(5)=75.56$, p=.041, and Asian British students, $H(5)=35.50$, p=.040. However, no significant relationships emerged for the other variables.

Demographic variable	Dependent variable	Test statistic	p
Ethnicity	Trait activation	2.19	.823
Ethnicity	Trait inhibition	3.06	.691
Ethnicity	Rumination	4.58	.470
Ethnicity	Optimistic thinking	7.21	.205
Ethnicity	Complex thinking	5.82	.325
Ethnicity	Resilience	21.58	.001

Appendix K

Themes of responses for discovering meaning as comprehensibility

Type of meaning	% (*n*)
Life lessons	36.92
"This experience has made me realize that you need to throw yourself into everything you can no matter what and take all the opportunities."	(144)
"Do you know what is most ironic? I'm getting more performances and tours without the degree right now, and have been putting off many money making opportunities when I was doing the music certificate. I should be more renowned as a musician than I am right now. It feels like proving I'm worthy to the scholars and academic giants...isn't really worth it, and never would be."	
"In some ways it does seem a little wasted – to be on the brink of strong friendships but simply lacking the time to do so because I only have less than half a year left. But it is always better to have loved and lost, than to not have loved at all, isn't it?"	
Entitlement	15.90
"I deserve to live my dreams, and not anyone else's, and I deserve to live them right now."	(62)
"Since I was a child, I wanted to do big things, like going to a good university, to do interesting things, participate in projects and catching interesting opportunities. This is the perfect opportunity and was made for me. I worked hard to get here"	
" I worked extremely hard to get here and there is a plan. Weeping may endure for the night but joy	

cometh in the morning. It would be over soon and then I could enjoy the benefits of my hard work."

Experienced personal growth   43.33

(169)

"I think coming to university has played a large role in my personal development and, as I think of it, improvement. The personal development aspect holds more importance than the actual course and content, for me."

"This experience prepares you for facing life, to be mature and to learn how to solve unexpected problems by your own."

"The course is helping me grow as a person and I am trying to learn not to let things bother me as much. I do tend to dwell on the past and things that I can't change but I am trying to approach a new outlook on life and I am using the experiences at University to try and do this. I am not always successful as sometimes when I am presented with a situation that has no rational or persuasive argument I do still become frustrated but I feel like I am better at handling it now."

"It has made me a different person in terms of who and what I was before I came here too. I have a greater understanding. I've always been able to at least attempt to see things from the others' point of view, but now I stop myself and make sure I always do."

Deeper self-awareness   26.41

(103)

"University has made me realise how much I depend on my mum and how much I miss her and rely on her to make me feel better/stop worrying."

"At uni I have struggled to make close friends easily, I can do those casual, artificial types to friendships, with people that you see once or twice a week, but I find living with people very stressful and find that I start to resent people if I have to spend too much time around them. I have never really found relationships easy for this reason."

"moving out suggests that I'm an adult meaning my childhood has come to an end, which I find quite an uncomfortable thought as when I think about my relationship with my parents I still rely on them greatly."

"Coming to college has also redefined certain things, I guess – especially the notion of my own identity. It's easier to define yourself in relation to friends, to culture, to the background context. And being away from home only means that all these "background" factors are entirely lost and you have to start from scratch. In some ways it is liberating – you can almost literally create a new identity. In other ways it just makes it all that harder to be who you were or who you feel you genuinely are. It took me awhile, but I think after that period of the first year, I have settled in quite comfortably with who I am and how I fit in to the community around me."

Understanding university life   13.33
                                                                                                        (52)

 "Being in college is nothing like I imagined it to be. It is much harder. It gets lonely, it gets stressful, but unlike prior years, when you had your family beside you to help you cope with any struggles, this time, you are alone."

"It is difficult to say whether I regret not knowing my fellow college students better as I never felt the

need to further relationship with them beyond simple acquaintance. It's just a mish-mash of personalities for most part and I can't pretend that most of the activities or people seemed interesting to me because they weren't."

"Nowhere else better a place to move out of childhood and into adulthood. So many of you all going through the same thing, such a nice structure set up for you to fall into, so many older people around to offer help. Until you're old enough to offer help to others. Now I understand why so many third years tried to scare me about third year, it's because it's downright fun! Ahem. Sorry. The point is, it's wonderful. And terrifying, stressful, downright murderous, unforgiving, so very tiring… and wonderful. That's why we do it. It's living life to the full, very much to the full, and that's wonderful."

"I've really enjoyed uni it's been a chance to act more independently, be me, no worries about what to do, succeed fail on my own terms, enjoy living in house of people my age, have more control"

Focus on relationships	23.59
	(92)

"I am now able to reflect on how I react to other people who live differently to me, but are now who I am forced to live with."

"I remain close to my family and though I have lost contact with many friends from home I think that I am still close to the people that I have always been close to"

"I presume it took moving away from my friends and family to see how much I rely on them for support and encouragement in mundane challenges. Living in university has made me appreciate those close to

me even more, even those I've met since moving to university."

"I want it to matter and so much happened that I don't know how it couldn't have, but I need to be certain it will have made a difference, it's another place of uncertainty now, university didn't release me from that position, just gave a period of time so now in my uncertain world I have new people around me, and others have gone or left the world forever, my family doesn't sustain me anymore, my partner and team-mate and best friend is on a different life path and I am with someone else and it is what it is"

Expected it/ prepared for it   10.77

(42)

"I think the university experience sets you up to truly become the person you're going to be for the rest of your life, and so for me, the impact of the idea of going to university is a very strong one, and so I see it as a very important part of my life."

"I mean, I know it would be quite a change, to say the least; I remember thinking like all my life until that point I'd been living through the prologue, or through a character's backstory, and that I was about to start chapter 1 of a book. Or something."

Similarity between yourself and others

"And I expected to immediately have close friends, which obviously didn't happen as we were all   15.90

strangers to each other."   (62)

"I also recognise that each person's experience of university is different, but I'm sure that for everyone it is the best and worst time of young adulthood!"

"We all have to keep one thing in mind. The awesome feeling of looking back on all that we have

accomplished thus far. This too shall pass. The finish line is near."

Coming to terms with responsibility   22.56 (88)

 "However, I do realise that you can't just stay here forever, and that eventually I will have to get a job and contribute to society."

"In general i am quite disappointed by my grades so far. I cannot blame anyone else for them, as it is my own fault that i just did not work hard enough to get the grades that i wanted."

"Since coming to college I realise how much I took for granted being at home – didn't need to worry about food or cooking, washing and even laundry. Was really spoiled at home and now having to think about budgets and worry about these little things have been a learning curve."

Hope   8.72 (34)

 "I just hope I am good enough to do well in it. Plus with a degree I hope I'll be able to get a good job."

"I am very much looking forward to qualifying as I was working full-time before the course began and I got used to a good wage and now I am worried that the career I have chosen doesn't pay as well as the one I was in before, however I think it will be worth it as there is a lot of scope to develop and learn and help people"

"With regards to the future I have goals I would like to achieve, however as long as I continue to be ambitious and do the best I can, I'm confident/hoping I will be fine."

Spirituality/Faith   5.13 (20)

 "University is God's will for my life. Whatever I face here is all part of the grand plan"

"Whatever happens, happens because of Him...It's a slog, not going to lie, but He throws you some good

and bad things. Got to make the most of it I guess and suck it up. One more year. Just one more year to go!!"

"Being in college has also been quite relevant to my spiritual life, simply because of the community that surrounds me. I think I have grown substantially over the past 3 years, in my relationship with God, my understanding of him, my relationship with fellow evangelical Christians. It's been a refreshing experience and entirely rewarding."

"My education is my key to success. It is the gift that God blessed me with so it is up to me to fulfill my potential."

Appendix L

Themes of responses for discovering meaning as significance

Type of meaning	% (*n*)
Cultural exposure	16.92 (66)

 "I get to meet friends at uni (university) from different backgrounds and learn more about different cultures as uni is the perfect place to do so with international students."

"The culture here in the UK is quite different from that of back home – we don't drink as much, for one. Or the drinking culture is not as widespread and ubiquitous. At home, freshers' week is full of games and activities, here the main activity is just drinking, going out and getting hammered for the entire week."

"I think the actual degree – a BSc in Psychology – means very little to me, relative to all the experience I've gained in terms of understanding a new culture, integrating into that new culture and finding a place for myself. It's been a wonderful 2.5 years so far."

"College helped me re evaluate the way I think I think about certain things and helped me appreciate thing that I think are lacking in certain parts of the world. For instance basic manners, I don't think I'll ever get used to saying good morning, having no one answer and just having to remember it's not an

insult, it's just the way these people are."

Developing skills   36.41

(142)

"I am more confident in approaching people and igniting a relevant relationship with whoever it is
with."

"I'm not just wondering around, going to auditions and getting rejected, but getting to do 2 things
properly, along with learning russian and other things, so I'm becoming a better person and I have more
skills as well as refining the ones that i have got!"

"I think the most practical was just learning to live away from home, to be entirely independent, having
to cook, clean, do laundry, manage my own time and finances. Also things like travelling on my own
for the first time was quite an experience – it did seem quite daunting at first, both exciting and
stressful, but after the first extended period of travelling, it seemed so much easier, probably because my
confidence grew as well."

Networking opportunities   20.26

(79)

"The opportunities are endless, there are friends constantly on tap – people are always around, there is
always something to do"

"I am so glad I have had the opportunity to go to uni. I have loved studying and learning and building

up contacts for my future."

"I joined more clubs than even most freshers, went to most of them, made friends there too. I hung round with religious people, worked out what I believe in, and so ended up hanging round with just the people I agreed with, because there's only so many debates you can put yourself through."

"University is such a strange place. Nowhere else are there so many people to talk to, so much going on, so many of the same type of people thrown together and told to go to the pub and discuss the first random intelligent debating point you can think of."

Positive change in priorities/goals   31.28

(122)

"All in all I have been a very quiet and reserved person in the past who tries to stay within their comfort zone but now I would like to become a more confident person who has a go at everything, even a bit out of the comfort zone especially as this is what I need for a good career."

"The person I am now is different because of uni. I actually have an idea of what I want to do with my life now, rather than just plodding along and hoping for the best. I have passion, which I never had before. I didn't even realise what it was, I just presumed that getting good grades would get me to a better place, but I now know that interest and passion play a major role. I do not regret starting uni 2 or 3 years after everyone else my age. I could have graduated by now, but to be honest, the experiences

I've had between college and uni have helped me to realise a lot of things and have helped me grow up a hell of a lot. I now have a clear understanding of what I want, which makes me a changed person."

"Being in college has also made me realise that I am a very ambitious person and it's been a hit of reality because now I need to lower my expectations and start slowly."

"I used to play boardgames and do swordfighting. Which were fun but they don't really develop you that much. And You can have fun while doing something productive!"

University and the future	35.13 (137)

"Freedom I think is the main thing university has given me including freedom to do what I like in the future."

"I went to a very small school, where everyone always did very well and I was generally a failure. But here I am doing much better in competitive way which is giving me a lot more confidence and has lead me to make better applications for future placements than I think I excepted to do when I first started."

"The course that I am doing acts as a foundation for my ideal career in the future. Being at the university helps me in gaining the basic requirements for the job and there are a huge amount of resources that I could seek help from, in order to develop my skills and work experience."

Others will benefit	7.44

(29)

"It's a learning curve and that's a good thing and all these uni experiences will be able to pass down in later life to people I care about and those who just ask for a little advice. I mean I've already been able to use my own first term to advise my cousin which was nice because it made me feel helpful and useful."

"I want to have financial stability but not only that, but to carry my parents and siblings on vacations; to be able to explore the world. I want to be able to expose them to activities we couldn't enjoy growing up due to financial constraints and the sacrifices my parents were making for us. I want to excel at university to be able to treat my loved ones to life's 'wants' so to speak and not have to forego it because our resources are limited so only 'needs' could be met. I want to make my parents smile."

"In terms of my family, I am the first person to go to university apart from my cousins, and my family are always interested to hear how I do. It's nice to know I'm one of the first to go, and to encourage those younger ones from my extended family whenever I see them."

Strengthening family relationships/friendships   27.95

(109)

"It is still sometimes a bit weary at home, yet we have a healthier relationship where she is less dependent on me and I am happier because I can have my own decisions and opinions."

"... I still have the friends I have had all my life and i have built other memories with people in York... I

love my friends and I do have some amazingly close friends from university but i suppose the expectation of a perfect friendship group didn't really materialise and I realise now that i actually had and have an amazing group of people at home who have been around for years and always will be around and even if they aren't all people I confide in or spend life changing moments... they have been there for years and probably will continue to exist in my life for years to come and I am scared of leaving university because I don't know what the memories will mean when the whole experience is over"

"My old friends are still my friends and I possibly have a better relationship with my family because when I do find the time to go home, I make sure that I make the most of every minute I have with them. My younger brother has got a job here on weekends, so he comes to stay here in my house with me, which means that we are closer than we were when we lived together in my mum's house."

"This means that I do not have much time to spend with my family. But sometimes this might be a good thing, we will treasure each other better because we don't get to see each other often."

Positive personality change/growth   22.31 (87)

"I like how university has changed me as I now know that I will be able to survive by myself when I move out of my parents' house for real."

"I would not be the person I am today if I hadn't have experienced the last 3 years at uni. Looking back

I have really grown up since 1ˢᵗyear. I never think of myself as different to what I was then but now im thinking about it I really am. I have built confidence, I'm not shy, I'm well knowledged and feel I am an adult and can live independently."

" Realised how much I'd changed, already, that I was louder and happier than before."

"I feel I have changed a lot since coming to university, I believe for the better."

"being in a completely different environment gives you perspective on things back home – suddenly issues that used to seem so important when I was at home seem so trivial, or opinions that I clung to now seem so narrow-minded and limited. I like having this sort of distance – it helps to objectify my own thinking."

Increased personal fortitude   32.82

(128)

 "... I think that uni has helped me to look back over the person I have been and the harder, more difficult to deal with experiences and has helped me to consolidate them into the person that I am today."

"Uni has been the hardest thing I have done so far in my life. This is because there is so many different aspects to it.... moving away from my home (the other side of the world!), learning to budget, working a ridiculous amount of hours a week, earning little money, learning about friendships and relationships, filling in god knows how many forms, signing accommodation contracts and on top of all this... essays, assignments, exams and lectures. It all sounds really stressful, and to be honest, it really is. However, I

feel that without this experience I would not know the things i need to know to get by in life."

"College sucks major ass, no joke. Sighhhhhh. Wish there was something else I could be doing, it's definitely much harder than anything I've ever done. << Understatement. Lots of discipline. but unfortunately it's a necessary evil to get where I want to go and I won't give up."

"I have pushed myself in ways I would never have thought possible. I've learned stuff, had to do exams, had to learn to write appropriately, had to learn to interact with people who could, with all reasonability, been my kids. It's been up and down, but mostly up and I only take the positives out of it."

Appendix M

Demographic analyses from Study 11

Gender and ethnicity differences for the resilience and distress trajectories. Chi-square tests revealed no significant gender or ethnic differences on either of the two trajectories and no significant gender or ethnic differences for discovering either of the two forms of meaning.

Demographic variable	Dependent variable	Test statistic	p
Gender	Trajectory	1.89	.169
Gender	Meaning as comprehensibility	1.09	.579
Gender	Meaning as significance	1.17	.557
Ethnicity	Trajectory	5.97	.427
Ethnicity	Meaning as comprehensibility	4.31	.977
Ethnicity	Meaning as significance	9.25	.682

Gender and ethnicity differences for the three-year groups. Mann-Whitney U tests revealed significant gender differences for meaning as comprehensibility and meaning as significance (both ps = .000). In addition, Kruskall-Wallis tests showed significant ethnic differences in resilience scores (all ps <.05).

Demographic variable	Dependent variable	Test statistic	p
Gender	Meaning as comprehensibility	14,506.00	.000
Gender	Meaning as significance	25,796.00	.000
Ethnicity	Resilience	46.994	.000

References

Abdi, H., & Williams, L. J. (2010). Principal component analysis. *Wiley Interdisciplinary Reviews: Computational Statistics*, *2*(4), 433-459.

Aktekin, M., Karaman, T., Senol, Y. Y., Erdem, S., Erengin, H. & Akayadin, M. (2001). Anxiety, depression and stressful life events among medical students: a prospective study in Antalya, Turkey. *Medical Education, 35*, 12-17.

Allan, S., & Gilbert, P. (2002). Anger and anger expression in relation to perceptions of social rank, entrapment and depressive symptoms. *Personality and Individual Differences*, *32*(3), 551-565.

Alloy, L. B., Abramson, L. Y., Whitehouse, W. G., Hogan, M. E., Panzarella, C., & Rose, D. T. (2006). Prospective incidence of first onsets and recurrences of depression in individuals at high and low cognitive risk for depression. *Journal of Abnormal Psychology*, *115*(1), 145-156.Almedom, A. M. (2005). Resilience, hardiness, sense of coherence, and posttraumatic growth: All paths leading to "light at the end of the tunnel"?. *Journal of Loss and Trauma*, *10*(3), 253-265.

American Psychiatric Association. (1987). *Diagnostic and statistical manual of mental disorders* (3rd ed., text rev.)

Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin*, *103*(3), 411-423.

References

Andreotti, C., Thigpen, J. E., Dunn, M. J., Watson, K., Potts, J., Reising, M. M., Robinson, K. E., Rodriguez, E. M., Roubinov, D., Luecken, L. & Compas, B. E. (2013). Cognitive reappraisal and secondary control coping: associations with working memory, positive and negative affect, and symptoms of anxiety/depression. *Anxiety, Stress & Coping*, *26*(1), 20-35.

Arbuckle, J. L. (2010). *IBM SPSS Amos 19 user's guide*. Crawfordville, FL: Amos Development Corporation.

Arch, J. J., & Craske, M. G. (2006). Mechanisms of mindfulness: Emotion regulation following a focused breathing induction. *Behaviour Research and Therapy*, *44*(12), 1849-1858.

Armstrong, K. A., & Khawaja, N. G. (2002). Gender differences in anxiety: An investigation of the symptoms, cognitions, and sensitivity towards anxiety in a nonclinical population. *Behavioural and Cognitive Psychotherapy*, *30*(2), 227-231.

Bagozzi, R. P., & Heatherton, T. F. (1994). A general approach to representing multifaceted personality constructs: Application to state self-esteem. *Structural Equation Modeling: A Multidisciplinary Journal*, *1*(1), 35-67.

Baker, R. W., & Siryk, B. (1986). Exploratory intervention with a scale measuring adjustment to college. *Journal of Counseling Psychology*, *33*(1), 31-38.

References

Baldwin, D. R., Jackson, D., Okoh, I., & Cannon, R. L. (2010). Resiliency and

optimism: An African American senior citizen's perspective. *Journal of Black*

Psychology, 37 (1), 24-41.

Baron, R. S., Inman, M. L., Kao, C. F., & Logan, H. (1992). Negative emotion and

superficial social processing. *Motivation and Emotion*, *16*(4), 323-346.

Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction

in social psychological research: Conceptual, strategic, and statistical

considerations. *Journal of Personality and Social Psychology*, *51*(6), 1173-1182.

Bartone, P. T. (2006). Resilience under military operational stress: Can leaders

influence hardiness?. *Military Psychology*, *18*(5), 131-148.

Bannister, D. (1962). Personal construct theory: a summary and experimental

paradigm. *Acta Psychologica*, *20*, 104-120.

Bauer, J. J., & McAdams, D. P. (2004). Personal growth in adults' stories of life

transitions. *Journal of Personality*, *72*(3), 573-602.

Beauducel, A., & Herzberg, P. Y. (2006). On the performance of maximum

likelihood versus means and variance adjusted weighted least squares estimation

in CFA. *Structural Equation Modeling*, *13*(2), 186-203.

Beck, A. T. (1976). Cognitive therapy and the emotional disorders. New York:

International Universities Press.

References

Beck, A. T, & Emery, G. (1985). Anxiety Disorders and phobias: A cognitive

perspective. New York: Basic Books.

Beck, A. T, Rush, A. J., Shaw, B. E, & Emery, G. (1979). Cognitive therapy of

depression. New York: Guilford Press.

Benson, P. L. (2002). Adolescent development in social and community context: A

program of research. *New Directions for Youth Development, 95*, 123-147.

Berry, J. W., Worthington, E. L., O'Connor, L. E., Parrott, L., & Wade, N. G. (2005).

Forgivingness, vengeful rumination, and affective traits. *Journal of*

Personality, *73*(1), 183-226.

Bevvino, D. L., & Sharkin, B. S. (2003). Divorce adjustment as a function of finding

meaning and gender differences. *Journal of Divorce & Remarriage*, *39*(3-4), 81-

97.

Bitsika, V., Sharpley, C. F., & Peters, K. (2010). How is resilience associated with

anxiety and depression? Analysis of factor score interactions within a

homogeneous sample. *German Journal of Psychiatry*, *13*(1), 9-16.

Blalock, J. A., & Joiner Jr, T. E. (2000). Interaction of cognitive avoidance coping

and stress in predicting depression/anxiety. *Cognitive Therapy and*

Research, *24*(1), 47-65.Block, J. H., & Block, J. (1980). The role of ego-control

and ego-resiliency in the organization of behaviour. In W. A. Collins (Ed.), *The*

Minnesota Symposia on Child Psychology: Vol. 13. (pp. 39-101). Hillsdale, NJ:

Erlbaum

References

Bonanno, G.A. (2004). Loss, trauma, and human resilience: Have we underestimated the human capacity to thrive after extremely aversive events? *American Psychologist*, *59*, 20–28.

Bonanno, G. A., Papa, A., O'Neill, K., Westphal, M. & Coifman, K. (2004). The importance of being flexible: The ability to enhance and suppress emotional expression predicts long-term adjustment. *Psychological Science*, *15*, 482-487.

Bone, P. F., Sharma, S., & Shimp, T. A. (1989). A bootstrap procedure for evaluating goodness-of-fit indices of structural equation and confirmatory factor models. *Journal of Marketing Research*, 105-111.

Borkovec, T. D., Ray, W. J., & Stober, J. (1998). Worry: A cognitive phenomenon intimately linked to affective, physiological, and interpersonal behavioural processes. *Cognitive Therapy and Research, 6,* 561-576.

Bower, G. H. (1981). Mood and memory. *American Psychologist, 36*, 129-148.

Bower, J. E., Kemeny, M. E., Taylor, S. E., & Fahey, J. L. (1998). Cognitive processing, discovery of meaning, CD4 decline, and AIDS-related mortality among bereaved HIV-seropositive men. *Journal of Consulting and Clinical Psychology*, *66*(6), 979-986.

Brainerd, C. J., Stein, L. M., Silveira, R. A., Rohenkohl, G., & Reyna, V. F. (2008). How does negative emotion case false memories? *Psychological Science, 19*, 919-925.

Brodsky, A. E. (1999). " Making it": the components and process of resilience among urban, African-American, single mothers. *American Journal of Orthopsychiatry* , *69*(2), Apr 1999, 148-160.

Brooke, P. P., Russell, D. W., & Price, J. L. (1988). Discriminant validation of measures of job satisfaction, job involvement, and organizational commitment. *Journal of Applied Psychology*, *73*(2), 139-145.

Brown, W. J., & Trost, S. G. (2003). Life transitions and changing physical activity patterns in young women. *American Journal of Preventive Medicine*, *25*(2), 140-143.

Bryant, F. (2003). Savoring Beliefs Inventory (SBI): A scale for measuring beliefs about savouring. *Journal of Mental Health*, *12*(2), 175-196.

Bryman, A., & Cramer, D. (2011). *Quantitative data analysis with IBM SPSS 17, 18 and 19: a guide for social scientists*. Hove: Routledge.

Burns, J. W., Kubilus, A., & Bruehl, S. (2003). Emotion induction moderates effects of anger management style on acute pain sensitivity. *Pain*, *106*(1), 109-118.

Byrne, B. M. (2001). *Structural equation modeling with AMOS: Basic concepts, applications, and programming*. Mahwah, NJ: Erlbaum

Byrne, B. M. (2010). *Structural Equation Modeling Using AMOS. Basic concepts, applications, and programming (2nd edition)*. New York: Routledge.

Calmes, C. A., & Roberts, J. E. (2007). Repetitive thought and emotional distress: Rumination and worry as prospective predictors of depressive and anxious symptomatology. *Cognitive Therapy and Research*, *31*(3), 343-356.

Campbell-Sills, L., Cohan, S. L., & Stein, M. B. (2006). Relationship of resilience to personality, coping, and psychiatric symptoms in young adults. *Behaviour Research and Therapy*, *44*(4), 585-599.

Cantor, N. (1990). From thought to behaviour:" Having" and" doing" in the study of personality and cognition. *American Psychologist*, *45*(6), 735-750.

Carver C.S. & Harmon-Jones E. (2009). Anger is an approach-related affect: evidence and implications. *Psychological Bulletin, 135*, 183-204

Carver, C. S., Scheier, M. F., & Segerstrom, S. C. (2010). Optimism. *Clinical Psychology Review, 30*, 879 – 889.

Carver, C. S., Pozo, C., Harris, S. D., Noriega, V., Scheier, M. F., Robinson, D. S. & Clark, K. C. (1993). How coping mediates the effect of optimism on distress: a study of women with early stage breast cancer. *Journal of Personality and Social Psychology*, *65*(2), 375-390.

Cattell, R. B. (1966). The scree test for the number of factors. *Multivariate Behavioural Research*, *1*(2), 245-276.

References

Chang, E.C. (1996). Evidence for the cultural specificity of pessimism in Asians vs. Caucasians: A test of a general negativity hypothesis. *Personality and Individual Differences, 21*, 819–822.

Charney D. S. (2004). Psychobiological mechanisms of resilience and vulnerability: implications for successful adaptation to extreme stress. *American Journal of Psychiatry, 161,* 195–216.

Chemers, M. M., Hu, L., & Garcia, B. (2001). Academic self-efficacy and first-year college student performance and adjustment. *Journal of Educational Psychology, 93*(1), 55-65.

Cicchetti, D., & Walker, E. F. (2001). Editorial: Stress and development: Biological and psychological consequences. *Development and Psychopathology*, *13* (3), 413-418.

Clark, D. M. (1996). Panic disorder: From theory to therapy. In P. M. Salkovskis (Ed.), *Frontiers of Cognitive Therapy* (pp. 318-344). New York: Guilford Press.

Cohen, S. (1986). Contrasting the Hassles Scale and the Perceived Stress Scale: Who is really measuring appraised stress? *American Psychologist, 41*, 716-718.

Connor, K. M., & Davidson, J. R. (2003). Development of a new resilience scale: The Connor-Davidson resilience scale (CD-RISC). *Depression and Anxiety*,*18*(2), 76-82.

Cornell, D. G., Peterson, C. S., & Richards, H. (1999). Anger as a predictor of aggression among incarcerated adolescents. *Journal of Consulting and Clinical Psychology*, *67*(1), 108-115.

Criss, M. M., Pettit, G. S., Bates, J. E., Dodge, K. A., & Lapp, A. L. (2002). Family adversity, positive peer relationships, and children's externalizing behaviour: A longitudinal perspective on risk and resilience. *Child Development*,*73*(4), 1220-1237.

Cronbach, L. J. (1947). Test "reliability": Its meaning and determination. *Psychometrika, 12*, 1-16.

Cudeck, R. (2000). Exploratory factor analysis. *Handbook of Applied Multivariate Statistics and Mathematical Modeling*, 265-296.

Culhane, S. E., & Morera, O. F. (2010). Reliability and validity of the Novaco Anger Scale and Provocation Inventory (NAS-PI) and State-Trait Anger Expression Inventory-2 (STAXI-2) in hispanic and non-hispanic white student samples. *Hispanic Journal of Behavioural Sciences*, *32*(4), 586-606.

Dalton, P. & Dunnett, G. (2005). *A Psychology for Living: personal construct theory for professionals and clients (2ᵈ edition)*. London: Whurr.

Davey, G. C. (1993). A comparison of three worry questionnaires. *Behaviour Research and Therapy*, *31*(1), 51-56.

References

Davey, L., Day, A., & Howells, K. (2005). Anger, over-control and serious violent offending. *Aggression and Violent Behaviour*, *10*(5), 624-635.

Davis, C. G., & Morgan, M. S. (2008). Finding meaning, perceiving growth, and acceptance of tinnitus. *Rehabilitation Psychology*, *53*(2), 128-138.

Davis, C. G., Nolen-Hoeksema, S., & Larson, J. (1998). Making sense of loss and benefiting from the experience: two construals of meaning. *Journal of Personality and Social Psychology*, *75*(2), 561-574.

Deffenbacher, J. L., Huff, M. E., Lynch, R. S., Oetting, E. R., & Salvatore, N. F. (2000). Characteristics and treatment of high-anger drivers. *Journal of Counseling Psychology*, *47*(1), 5-17.

Diagnostic and Statistical Manual of Mental Disorders (3rd edition revised) (1987). Washington DC: American Psychiatric Association.

Dunning, C. (2003). Sense of coherence in managing trauma workers. In D. Paton, J.M. Violanti, & L.M. Smith (Eds.), *Promoting capabilities to manage posttraumatic stress: Perspectives on resilience* (pp. 119-135). Springfield, Illinois: Charles C Thomas.

Dyson, R., & Renk, K. (2006). Freshmen adaptation to university life: Depressive symptoms, stress, and coping. *Journal of Clinical Psychology*,*62*(10), 1231-1244.

Edwards, M. J., & Holden, R. R. (2001). Coping, meaning in life, and suicidal manifestations: Examining gender differences. *Journal of Clinical Psychology*, *57*(12), 1517-1534.

Efron, B., & Tibshirani, R. (1993). *An Introduction to the Bootstrap*. London: Chapman and Hall.

Egan, K., Harcourt, D., Rumsey, N., & Appearance Research Collaboration. (2011). A qualitative study of the experiences of people who identify themselves as having adjusted positively to a visible difference. *Journal of Health Psychology, 16* (5), 739-749.

Elwood, L. S., Wolitzky-Taylor, K., & Olatunji, B. O. (2012). Measurement of anxious traits: a contemporary review and synthesis. *Anxiety, Stress & Coping*, *25*(6), 647-666.

Emmons, R. A. (1992). Revenge: Individual differences and correlates. In *100th annual convention of the American Psychological Association, Washington, DC*.

Emmons, R. A., & Stern, R. (2013). Gratitude as a psychotherapeutic intervention. *Journal of Clinical Psychology*, *69*(8), 846-855.

Erwin, B. A., Heimberg, R. G., Schneier, F. R., & Liebowitz, M. R. (2003). Anger experience and expression in social anxiety disorder: Pretreatment profile and predictors of attrition and response to cognitive-behavioural treatment. *Behaviour Therapy*, *34*(3), 331-350.

References

Evans, J. R., & Mathur, A. (2005). The value of online surveys. *Internet Research*, *15*(2), 195-219.

Eysenck, M. W., & Van Berkum, J. (1992). Trait anxiety, defensiveness, and the structure of worry. *Personality and Individual Differences*, *13*(12), 1285-1290.

Fabrigar, L. R., Wegener, D. T., MacCallum, R. C., & Strahan, E. J. (1999). Evaluating the use of exploratory factor analysis in psychological research. *Psychological Methods*, *4*(3), 272-299.

Farber, E. W., Schwartz, J. A., Schaper, P. E., Moonen, D. J., & McDaniel, J. S. (2000). Resilience factors associated with adaptation to HIV disease. *Psychosomatics*, *41*(2), 140-146.

Fergusson, D. M., & Lynskey, M. T. (1996). Adolescent resiliency to family adversity. *Journal of Child Psychology and Psychiatry*, *37*(3), 281-292.

Field, A. (2009). *Discovering statistics using SPSS*. London: Sage publications Limited.

Field, A. (2013). *Discovering statistics using IBM SPSS statistics*. London: Sage Publications Limited.

Field, T., Diego, M., Hernandez-Reif, M., Schanberg, S., Kuhn, C., Yando, R., & Bendell, D. (2003). Pregnancy anxiety and comorbid depression and anger: effects on the fetus and neonate. *Depression and Anxiety*, *17*(3), 140-151.

References

Fine, S. B. (1991). Resilience and human adaptability: Who rises above adversity?. *American Journal of Occupational Therapy*, *45*(6), 493-503.

Flach, F. (1990). The resilience hypothesis and posttraumatic stress disorder. *Posttraumatic stress disorder: Etiology, Phenomenology, and Treatment*, 36-45.

Flach, F. (1990). Disorders of the pathways involved in the creative process. *Creativity Research Journal*, *3*(2), 158-165.

Fleiss, J. L. (1971). Measuring nominal scale agreement among many raters. *Psychological Bulletin*, *76*, 378-382.

Fleiss, J. L., Cohen, J., & Everitt, B. S. (1969). Large sample standard errors of kappa and weighted kappa. *Psychological Bulletin*, *72*(5), 323.

Flora, D. B., & Curran, P. J. (2004). An empirical evaluation of alternative methods of estimation for confirmatory factor analysis with ordinal data. *Psychological Methods*, *9*(4), 466-491.

Floyd, F. J., & Widaman, K. F. (1995). Factor analysis in the development and refinement of clinical assessment instruments. *Psychological Assessment*, *7*(3), 286-299.

Folkman, S. (1997). Positive psychological states and coping with severe stress. *Social Science & Medicine*, *45*(8), 1207-1221.

Folkman, S., & Moskowitz, J. T. (2000). Positive affect and the other side of coping. *American Psychologist*, *55*(6), 647-654.

Fox, S., & Spector, P. E. (1999). A model of work frustration–aggression. *Journal of Organizational Behaviour*, *20*(6), 915-931.

Francis, M.E., & Pennebaker, J.W. (1993). *LIWC: Linguistic Inquiry and Word Count. Technical Report*. Dallas, TX: Southern Methodist University.

Fredrickson, B. L. (2001). The role of positive emotions in positive psychology: The broaden-and-build theory of positive emotions. *American Psychologist*,*56*(3), 218-226.

Fredrickson, B. L., & Branigan, C. (2005). Positive emotions broaden the scope of attention and thought-action repertoires. *Cognition & Emotion*, *19*(3), 313-332.

Fredrickson, B. L., Mancuso, R. A., Branigan, C., & Tugade, M. M. (2000). The undoing effect of positive emotions. *Motivation and Emotion, 24*, 237–258.

Fredrickson, B. L., Tugade, M. M., Waugh, C. E., & Larkin, G. R. (2003). What good are positive emotions in crisis? A prospective study of resilience and emotions following the terrorist attacks on the United States on September 11th, 2001. *Journal of Personality and Social Psychology*, *84*(2), 365-376.

Fresco, D. M., Frankel, A. N., Mennin, D. S., Turk, C. L., & Heimberg, R. G. (2002). Distinct and overlapping features of rumination and worry: The relationship of cognitive production to negative affective states. *Cognitive Therapy and Research*, *26*(2), 179-188.

Garmezy N. (1985). Stress-resistant children: The search for protective factor. In J. E. Stevenson (Ed.), *Recent research in developmental psychopathology, Journal of Child Psychology and Psychiatry Book Supplement No. 4* (pp. 213–233), Oxford: Pergamon Press.

Garmezy, N., Masten, A. S., & Tellegen, A. (1984). The study of stress and competence in children: A building block for developmental psychopathology. *Child Development*, 97-111.

Gastonis, C., & Sampson, A. R. (1989). Multiple correlation: Exact power and sample size calculations. *Psychological Bulletin, 106,* 516-524.

Gick, M. L., & Thompson, W. G. (1997). Negative affect and the seeking of medical care in university students with irritable bowel syndrome: a preliminary study. *Journal of Psychosomatic Research*, *43*(5), 535-540.

Goodhart, D. E. (1985). Some psychological effects associated with positive and negative thinking about stressful event outcomes: Was Pollyanna right? *.Journal of Personality and Social Psychology*, *48*(1), 216-232.

Gore, S. and Eckenrode, J. (1994). Context and process in research on risk and resilience. In R. J. Haggerty, L. R. Sherrod, N. Garmezy & M. Rutter (Eds.), *Stress, Risk and Resilience in Children and Adolescents: Processes, Mechanisms and Interventions* (pp. 19-63), New York: Cambridge University Press.

Graham, J. M., Guthrie, A. C., & Thompson, B. (2003). Consequences of not interpreting structure coefficients in published CFA research: A reminder. *Structural Equation Modeling*, *10*(1), 142-153.

Granger, D. A., & Kivlighan, K. T. (2003). Integrating biological, behavioural, and social levels of analysis in early child development: Progress, problems, and prospects. *Child Development*, *74*(4), 1058-1063.

Gray, A. (1991). Neural systems, emotion, and personality. In J. Madden IV (Ed.), *Neurobiology of Learning, Emotion, and Affect*, (pp. 273–306). New York: Raven Press.

Greenberg, M. (1995). Cognitive processing in trauma: The role of intrusive thoughts and reappraisals. *Journal of Applied Social Psychology, 25*, 1262-1296.

Greene, S. M. (1981). Levels of measures of hopelessness in the general population. *British Journal of Clinical Psychology*, 20, 11-14.

Guadagnoli, E., & Velicer, W. F. (1988). Relation to sample size to the stability of component patterns. *Psychological Bulletin*, *103*(2), 265-275.

Gum, A., & Snyder, C. R. (2002). Coping with terminal illness: The role of hopeful thinking. *Journal of Palliative Medicine*, *5*(6), 883-894.

Halamandaris, K. F., & Power, K. G. (1999). Individual differences, social support and coping with the examination stress: A study of the psychosocial and

academic adjustment of first year home students. *Personality and Individual Differences*, *26*(4), 665-685.

Hall, N. C., Hladkyj, S., Perry, R. P., & Ruthig, J. C. (2004). The role of attributional retraining and elaborative learning in college students' academic development. *The Journal of Social Psychology*, *144*(6), 591-612.

Hall, R. J., Snell, A. F., & Foust, M. S. (1999). Item parceling strategies in SEM: Investigating the subtle effects of unmodeled secondary constructs. *Organizational Research Methods*, *2*(3), 233-256.

Harmon-Jones, E. (2003). Anger and the behavioural approach system. *Personality and Individual Differences, 35*, 995-1005.

Harmon-Jones, E., Gable, P. A., & Peterson, C. K. (2010). The role of asymmetric frontal cortical activity in emotion-related phenomena: A review and update. *Biological Psychology, 84*, 451–462.

Harris, P. W., Pepper, C. M., & Maack, D. J. (2008). The relationship between maladaptive perfectionism and depressive symptoms: The mediating role of rumination. *Personality and Individual Differences*, *44*(1), 150-160.

Harrington, J. A., & Blankenship, V. (2002). Ruminative Thoughts and Their Relation to Depression and Anxiety. *Journal of Applied Social Psychology*,*32*(3), 465-485.

References

Harris, P. R., & Lightsey, O. R. Jr., (2005). Constructive thinking as a mediator of the relationship between extraversion, neuroticism, and subjective well-being. *European Journal of Personality, 19*, 409–426.

Hau, K. T., & Marsh, H. W. (2004). The use of item parcels in structural equation modelling: Non-normal data and small sample sizes. *British Journal of Mathematical and Statistical Psychology*, *57*(2), 327-351.

Hazebroek, J. F., Howells, K., & Day, A. (2001). Cognitive appraisals associated with high trait anger. *Personality and Individual Differences*, *30*(1), 31-45.

Hayes, A. F. (2008). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. New York: Guilford Press.

Hayes, A. F. (2012). PROCESS: A versatile computational tool for observed variable mediation, moderation, and conditional process modeling. *Manuscript submitted for publication*.

Hayes, A. F., & Matthes, J. (2009). Computational procedures for probing interactions in OLS and logistic regression: SPSS and SAS implementations. *Behaviour Research Methods*, *41*(3), 924-936.

Hayton, J. C., Allen, D. G., & Scarpello, V. (2004). Factor retention decisions in exploratory factor analysis: A tutorial on parallel analysis. *Organizational Research Methods*, *7*(2), 191-205.

Higgins, G. O. C. (1994). *Resilient adults: Overcoming a cruel past*. San Francisco: Jossey-Bass.

Holland, J. M., Currier, J. M., & Neimeyer, R. A. (2006). Meaning reconstruction in the first two years of bereavement: The role of sense-making and benefit-finding. *OMEGA--Journal of Death and Dying*, *53*(3), 175-191.

Hong, R. Y. (2007). Worry and rumination: Differential associations with anxious and depressive symptoms and coping behaviour. *Behaviour Research and Therapy*, *45*(2), 277-290.

Honk, J. V., Tuiten, A., de Haan, E., vann de Hout, M., & Stam, H. (2001). Attentional biases for angry faces: Relationships to trait anger and anxiety.*Cognition & Emotion*, *15*(3), 279-297.

Hood, A., Pulvers, K., Carrillo, J., Merchant, G., & Thomas, M. D. (2012). Positive traits linked to less pain through lower pain catastrophizing. *Personality and Individual Differences*, *52*(3), 401-405.

Horn, J. L. (1965). A rationale and test for the number of factors in a factor analysis. *Psychometrika, 30*(2), 179-185.

Horowitz, M.J. (1975). Intrusive and repetitive thoughts after experimental stress: a summary. *Archives of General Psychiatry, 32*, 1457-1463.

Horowitz, M. J. (1986). Stress-response syndromes: A review of posttraumatic and adjustment disorders. *Psychiatric Services*, *37*(3), 241-249.

References

Horowitz, M. J., & Solomon, G. F. (1975). A prediction of delayed stress response syndromes in Vietnam veterans. *Journal of Social Issues*, *31*(4), 67-80.

Houghton, J. D., & Jinkerson, D. L. (2007). Constructive thought strategies and job satisfaction: A preliminary examination. *Journal of Business and Psychology*, *22*(1), 45-53.

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, *6*(1), 1-55.

Hudley, C., & Graham, S. (1993). An attributional intervention to reduce peer-directed aggression among African-American boys. *Child Development*, *64*(1), 124-138.

Huey Jr, S. J., & Weisz, J. R. (1997). Ego control, Ego resiliency, and the Five-Factor Model as predictors of behavioural and emotional problems in clinic-referred children and adolescents. *Journal of Abnormal Psychology*, *106*(3), 404-415.

Hunter, A. J., & Chandler, G. E. (1999). Adolescent resilience. *Image: The Journal of Nursing Scholarship*, *31*(3), 243-247.

IBM software (2010). *IBM SPSS Statistics for Windows, Version 19.0*. Armonk, NY: IBM Corp.

Ichikawa, M., & Konishi, S. (1995). Application of the bootstrap methods in factor analysis. *Psychometrika, 60*(1), 77-93.

Jacelon, C. S. (1997). The trait and process of resilience. *Journal of Advanced Nursing*, *25*(1), 123-129.

Jackson, D.C, Burghy, C.A., Hanna, A.J., Larson, C.L., & Davidson, R.J. (2000). *Resting frontal and anterior temporal EEG asymmetry predicts ability to regulate negative emotion*. Paper presented at the Annual Meeting of the Society for Psychophysiological Research, San Diego, CA.

Jackson, D.C., Malmstadt, J.R., Larson, C.L., & Davidson, R.J. (2000). Suppression and enhancement of emotional responses to unpleasant pictures. *Psychophysiology, 37,* 515-522.

Jackson, L. M., Pancer, S., Pratt, M. W., & Hunsberger, B. E. (2000). Great Expectations: The Relation Between Expectancies and Adjustment During the Transition to University1. *Journal of Applied Social Psychology*, *30*(10), 2100-2125.

Janoff-Bulman, R., & McPherson Frantz, C. (1997). The impact of trauma on meaning: From meaningless world to meaningful life. In C. R. Brewin & M. J. Power (Eds.), *The transformation of meaning of psychological therapies: Integrating theory and practice*. (pp. 91-106). New York, NY: John Wiley & Sons, Inc.

John, O. P. (1990). The "Big Five" factor taxonomy: Dimensions of personality in the natural language and questionnaires. In L. A. Pervie (Ed.), *Handbook of personality: Theory and research* (pp. 66-100). New York: Guilford.

Johnson SL, Eisner LR, Carver CS. (2009). Elevated expectancies among persons diagnosed with bipolar disorder. *British Journal of Clinical Psychology, 48*, 217–222

Kaiser, H. F. (1960). The application of electronic computers to factor analysis. *Educational and Psychological Measurement, 20*, 141-151.

Karademas, E. C. (2006). Self-efficacy, social support and well-being: The mediating role of optimism. *Personality and Individual Differences*, *40*(6), 1281-1290.

Kauffman, C., Grunebaum, H., Cohler, B., & Gamer, E. (1979). Superkids: Competent children of psychotic mothers. *The American Journal of Psychiatry, 136*(11), 1398–1402.

Khawaja, N. G., & Stallman, H. M. (2011). Understanding the Coping Strategies of International Students: A Qualitative Approach. *Australian Journal of Guidance and Counselling*, *21*(02), 203-224.

King, L. A., & Raspin, C. (2004). Lost and Found Possible Selves, Subjective Well-Being, and Ego Development in Divorced Women. *Journal of Personality*, *72*(3), 603-632.

Kelly, G.A. (1955*). The Psychology of Personal Constructs*. New York, Norton.

Kendall P.C., Howard B.L., Hayes R.C. (1989). Self-referent speech and psychopathology: The balance of positive and negative thinking. *Cognitive Therapy and Research, 13*, 583–598.

Kishton, J. M. & Widaman, K. F. (1994). Unidimensional versus domain representative parcelling of questionnaire items: An empirical example. *Educational and Psychological Measurement, 54*, 757-765.

Kline, P. (1994). *An easy guide to factor analysis*. London: Routledge.

Kline, R. B. (2011). *Principles and practice of structural equation modeling*. New York: Guilford press.

King, L. A., & Raspin, C. (2004). Lost and Found Possible Selves, Subjective Well-Being, and Ego Development in Divorced Women. *Journal of Personality*,*72*(3), 603-632.

Kocovski, N. L., & Rector, N. A. (2007). Predictors of Post-Event Rumination Related to Social Anxiety. *Cognitive Behaviour Therapy*, *36*(2), 112-122.

Kocovski, N. L., Endler, N. S., Rector, N. A., & Flett, G. L. (2005). Ruminative coping and post-event processing in social anxiety. *Behaviour Research and Therapy*, *43*(8), 971-984.

Kohout, F. J., Berkman, L. F., Evans, D. A., & Cornoni-Huntley, J. (1993). Two shorter forms of the CES-D depression symptoms index. *Journal of Aging and Health*, *5*(2), 179-193.

Kwok, O. M., Hughes, J. N., & Luo, W. (2006). Role of resilient personality on lower achieving first grade students' current and future achievement. *Journal of School Psychology*, *45*(1), 61-82.

Larsen, R. J., & Ketelaar, T. (1991). Personality and susceptibility to positive and negative emotional states. *Journal of Personality and Social Psychology, 61*, 132–140.

Lazarus, R., (1991). *Emotion and adaptation*. Cambridge, England: Oxford University Press.

Lazarus, R. S., & Folkman, S. (1984). *Stress, Appraisal, and coping*, New York: Springer.

Lei, P. W. (2009). Evaluating estimation methods for ordinal data in structural equation modeling. *Quality & Quantity, 43*, 495-507.

Lester, D. (2009). Emotions in personal construct theory: A review. *Personal Construct Theory & Practice*, *6*, 90-98.

Litt, M. D., Tennen, H., Affleck, G., & Klock, S. (1992). Coping and Cognitive factors in adaptation to in vitro fertilization failure. *Journal of Behavioural Medicine*,*15*(2), 171-187.

Little, T. D., Cunningham, W. A., Shahar, G., & Widaman, K. F. (2002). To parcel or not to parcel: Exploring the question, weighing the merits. *Structural Equation Modeling*, *9*(2), 151-173.

Litman, J. A., Collins, R. P., & Spielberger, C. D. (2005). The nature and measurement of sensory curiosity. *Personality and Individual Differences*,*39*(6), 1123-1133.

Liu, O. L., & Rijmen, F. (2008). A modified procedure for parallel analysis of ordered categorical data. *Behaviour Research Methods*, *40*(2), 556-562.

Luthar, S. S., Doemberger, C. H., & Zigler, E. (193). Resilience is not a unidimensional construct: Insights from a prospective study of inner-city adolescents. *Development and Psychopathology, 5*(4), 703-717.

Lyubomirsky, S., & Layous, K. (2013). How do simple positive activities increase well-being? *Current Directions in Psychological Science, 22*, 57– 62.

Lyubomirsky, S., & Nolen-Hoeksema, S. (1995). Effects of self-focused rumination on negative thinking and interpersonal problem solving. *Journal of Personality and Social Psychology*, *69*(1), 176-190.

MacLeod, A. K., Tata, P., Tyrer, P., Schmidt, U., Davidson, K., & Thompson, S. (2005). Hopelessness and positive and negative future thinking in parasuicide. *British Journal of Clinical Psychology*, *44*(4), 495-504.

MacLeod, C., & Rutherford, E. M. (1992). Anxiety and the selective processing of emotional information: Mediating roles of awareness, trait and state variables, and personal relevance of stimuli. *Behaviour Research and Therapy*, *30*(5), 479-491.

Manasse, M. E., & Ganem, N. M. (2009). Victimization as a cause of delinquency: The role of depression and gender. *Journal of Criminal Justice*,*37*(4), 371-378.

References

Mason, M. F., & Morris, M. W. (2010). Culture, attribution and automaticity: a social cognitive neuroscience view. *Social Cognitive and Affective Neuroscience*,*5*(2-3), 292-306.

Masten, A. S., & Narayan, A. J. (2012). Child development in the context of disaster, war, and terrorism: Pathways of risk and resilience. *Psychology*, *63*, 227-257.

Mattanah, J. F., Hancock, G. R., & Brand, B. L. (2004). Parental Attachment, Separation-Individuation, and College Student Adjustment: A Structural Equation Analysis of Mediational Effects. *Journal of Counseling Psychology*,*51*(2), 213-225.

Matthys, W., van Goozen, S. H., Vries, H. D., Cohen-Kettenis, P. T., & Engeland, H. V. (1998). The dominance of behavioural activation over behavioural inhibition in conduct disordered boys with or without attention deficit hyperactivity disorder. *Journal of Child Psychology and Psychiatry*, *39*(5), 643-651.

McCuaig Edge, H. J., & Ivey, G. W. (2012). Mediation of cognitive appraisal on combat exposure and psychological distress. *Military Psychology*, *24*(1), 71-85.

McCullough, M. E., Emmons, R. A., & Tsang, J. (2002). The grateful disposition: A conceptual and empirical topography. *Journal of Personality and Social Psychology, 82*, 112–127.

McLean, K. C. (2005). Late adolescent identity development: narrative meaning making and memory telling. *Developmental Psychology*, *41*(4), 683-691

McLean, K. C., & Thorne, A. (2003). Late adolescents' self-defining memories about relationships. *Developmental Psychology*, *39*(4), 635 - 645.

Michael, S. T., & Snyder, C. R. (2005). Getting unstuck: The roles of hope, finding meaning, and rumination in the adjustment to bereavement among college students. *Death Studies*, *29*(5), 435-458.

Mogg, K., Bradley, B.P. & Hallowell, N. (1994). Attentional bias to threat: Roles of trait anxiety, stressful events, and awareness. *Quarterly Journal of Experimental Psychology: Human Experimental Psychology, 47A*, 841–864.

Molina, S., Borkovec, T. D., Peasley, C., & Person, D. (1998). Content analysis of worrisome streams of consciousness in anxious and dysphoric participants.*Cognitive Therapy and Research*, *22*(2), 109-123.

Moos, R. H., & Schaefer, J. A. (1986). Life transitions and crises. In R.H. Moos & J.A.Schaefer (Eds.), *Coping with life crises: An Integrated Approach* (pp. 3-28). Springer US.

Moosbrugger, H., & Schermelleh-Engel, K. (1991). Determinants of pain experience: Perceived competence, trait anxiety, trait depression and moderator effects. *Personality and Individual Differences*, *12*(12), 1261-1266.

Montanelli Jr, R. G., & Humphreys, L. G. (1976). Latent roots of random data correlation matrices with squared multiple correlations on the diagonal: A Monte Carlo study. *Psychometrika*, *41*(3), 341-348.

References

Muller, D., Judd, C. M., & Yzerbyt, V. Y. (2005). When moderation is mediated and mediation is moderated. *Journal of Personality and Social Psychology*,*89*(6), 852-863.

Muris, P., Roelofs, J., Rassin, E., Franken, I., & Mayer, B. (2005). Mediating effects of rumination and worry on the links between neuroticism, anxiety and depression. *Personality and Individual Differences*, *39*(6), 1105-1111.

Murphy, S. A., Clark Johnson, L., & Lohan, J. (2003). Finding meaning in a child's violent death: a five-year prospective analysis of parents' personal narratives and empirical data. *Death Studies*, *27*(5), 381-404.

National Institute of Child Health and Human Development Early Child Care Research Network. (2002). Child-care structure→ process→ outcome: Direct and indirect effects of child-care quality on young children's development. *Psychological Science*, *13*(3), 199-206.

Nevitt, J., & Hancock, G. R. (2001). Performance of bootstrapping approaches to model test statistics and parameter standard error estimation in structural equation modeling. *Structural Equation Modeling*, *8*(3), 353-377.

Ng, K. Y., Ang, S., & Chan, K. Y. (2008). Personality and leader effectiveness: a moderated mediation model of leadership self-efficacy, job demands, and job autonomy. *Journal of Applied Psychology*, *93*(4), 733-743.

Nolen-Hoeksema, S. (1991). Responses to depression and their effects on the

   duration of depressive episodes. *Journal of Abnormal Psychology*, *100*(4), 569-

   582.

Nolen-Hoeksema, S. (2000). The role of rumination in depressive disorders and

   mixed anxiety/depressive symptoms. *Journal of Abnormal Psychology*, *109*(3),

   504-511.

Nolen-Hoeksema, S., & Harrell, Z. A. (2002). Rumination, depression, and alcohol

   use: Tests of gender differences. *Journal of Cognitive Psychotherapy*,*16*(4), 391-

   403.

Nolen-Hoeksema, S., & Morrow, J. (1991). A prospective study of depression and

   posttraumatic stress symptoms after a natural disaster: the 1989 Loma Prieta

   Earthquake. *Journal of Personality and Social Psychology*, *61*(1), 115-121.

Nolen-Hoeksema, S., Wisco, B. E., & Lyubomirsky, S. (2008). Rethinking

   rumination. *Perspectives on Psychological Science*, *3*(5), 400-424.

O'Connor, B. P. (2000). SPSS and SAS programs for determining the number of

   components using parallel analysis and Velicer's MAP test. *Behaviour Research

   Methods, Instruments, & Computers*, *32*(3), 396-402.

O'Connor, R. C., & Forgan, G. (2007). Suicidal thinking and perfectionism: The role

   of goal adjustment and behavioural inhibition/activation systems (BIS/BAS).

   Journal of Rational-Emotive & Cognitive-Behaviour Therapy, *25*(4), 321-341.

References
_____

O'Leary, V. E., Ickovics, J. R. & Ryan, M. (1992). *Resilience in women.* Paper

 presented at the Spring Foundation Conference, Palo Alto, CA.

Ong, A. D., Bergeman, C. S., Bisconti, T. L., & Wallace, K. A. (2006). Psychological

 resilience, positive emotions, and successful adaptation to stress in later

 life. *Journal of Personality and Social Psychology*, *91*(4), 730-749.

Owens, R. J., & Wedeking, J. P. (2011). Justices and legal clarity: Analyzing the

 complexity of US supreme court opinions. *Law & Society Review*, *45*(4), 1027-

 1061.

Pakenham, K. I., Sofronoff, K., & Samios, C. (2004). Finding meaning in parenting a

 child with Asperger syndrome: Correlates of sense making and benefit

 finding. *Research in Developmental Disabilities*, *25*(3), 245-264.

Pallant, J. (2007). *A step-by-step guide to data analysis using SPSS version

 15.* Maidenhead: Open University Press.

Palmer, N. (1997). Resilience in adult children of alcoholics: A nonpathological

 approach to social work practice. *Health & Social Work*, *22*(3), 201-209.

Pancer, S. M., Hunsberger, B., Pratt, M. W., & Alisat, S. (2000). Cognitive

 complexity of expectations and adjustment to university in the first year. *Journal

 of Adolescent Research*, *15*(1), 38-57.

References

Park, C. L. (2010). Making sense of the meaning literature: an integrative review of meaning making and its effects on adjustment to stressful life events.*Psychological Bulletin*, *136*(2), 257-301.

Parrott, D. J., Zeichner, A., & Evces, M. (2005). Effect of trait anger on cognitive processing of emotional stimuli. *The Journal of General Psychology*, *132*(1), 67-80.

Paton, D. & Smith, L.M. (1996). Psychological trauma in critical occupations: methodological and assessment strategies. In D. Paton & J.M. Violanti (Eds),*Traumatic Stress in Critical Occupations: Recognition, Consequences, and Treatment* (15-57). Springfield, Illinois: Charles C. Thomas.

Papageorgiou, C.& Wells, A. (1999). Process and meta-cognitive dimensions of depressive and anxious thoughts and relationships with emotional intensity**.** *Clinical Psychology and Psychotherapy, 6*, 156–162.

Pennebaker, J. W. (1985). Traumatic experience and psychosomatic disease: Exploring the roles of behavioural inhibition, obsession, and confiding. *Canadian Psychology*, *26*(2), 82-95.

Pennebaker, J. W., & Francis, M. E. (1996). Cognitive, emotional, and language processes in disclosure. *Cognition & Emotion*, *10*(6), 601-626.

Pennebaker, J. W., Francis, M. E., & Booth, R. J. (2001). *Linguistic Inquiry and Word Count (LIWC)*. Mahwah, NJ: Erlbaum

References

Pennebaker, J. W., Mayne, T. J., & Francis, M. E. (1997). Linguistic predictors of adaptive bereavement. *Journal of Personality and Social Psychology*, *72*(4), 863-871.

Pennebaker, J. W., Mehl, M. R., & Niederhoffer, K. G. (2003). Psychological aspects of natural language use: Our words, our selves. *Annual Review of Psychology*, *54*(1), 547-577.

Pennebaker, J. W., & King, L. A. (1999). Linguistic styles: language use as an individual difference. *Journal of Personality and Social Psychology*, *77*(6), 1296-1312.

Phelps, E. A., O'Connor, K. J., Gatenby, J. C., Gore, J. C., Grillon, C., & Davis, M. (2001). Activation of the left amygdala to a cognitive representation of fear. *Nature Neuroscience*, *4*(4), 437-441.

Pickering, A.D. & Gray, J.A. (1999). The neuroscience of personality. In L. Pervin & O. John (Eds.), *Handbook of Personality* (2nd ed., pp.277–299). New York: Guilford Press

Pittman, L. D., & Richmond, A. (2008). University belonging, friendship quality, and psychological adjustment during the transition to college. *The Journal of Experimental Education*, *76*(4), 343-362.

Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behaviour Research Methods, Instruments, and Computers, 36*, 717-731.

References

Preacher, K. J., & Hayes, A. F. (2008a). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behaviour Research Methods, 40*, 879-891.

Preacher, K. J., Rucker, D. D., & Hayes, A. F. (2007). Assessing moderated mediation hypotheses: Theory, method, and prescriptions. *Multivariate Behavioural Research, 42*, 185-227.

Prinzmetal, W., McCool, C., & Park, S. (2005). Attention: reaction time and accuracy reveal different mechanisms. *Journal of Experimental Psychology: General*, *134*(1), 73-92.

Pritchard, M. E., Wilson, G. S., & Yamnitz, B. (2007). What predicts adjustment among college students? A longitudinal panel study. *Journal of American College Health*, *56*(1), 15-22.

Prussia, G. E., Anderson, J. S., & Manz, C. C. (1998). Self-leadership and performance outcomes: The mediating influence of self-efficacy. *Journal of Organizational Behaviour*, *19*(5), 523-538.

Rabkin, J. G., Remien, R., Williams, J. B., & Katoff, L. (1993). Resilience in adversity among long-term survivors of AIDS. *Psychiatric Services*, *44*(2), 162-167.

Radloff, L. S. (1977). The CES-D Scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement, 1*, 385-401.

References

Raes, F. (2010). Rumination and worry as mediators of the relationship between self-compassion and depression and anxiety. *Personality and Individual Differences*, *48*(6), 757-761.

Ray, R. D., Ochsner, K. N., Cooper, J. C., Robertson, E. R., Gabrieli, J. D., & Gross, J. J. (2005). Individual differences in trait rumination and the neural systems supporting cognitive reappraisal. *Cognitive, Affective, & Behavioural Neuroscience*, *5*(2), 156-168.

Rayle, A. D., & Chung, K. Y. (2007). Revisiting first-year college students' mattering: Social support, academic stress, and the mattering experience.*Journal of College Student Retention: Research, Theory and Practice*, *9*(1), 21-37.

Reidy, J. (2004). Trait anxiety, trait depression, worry, and memory. *Behaviour research and therapy*, *42*(8), 937-948.

Reisman, J. (1990). Intimacy in same-sex friendships. *Sex Roles, 23,* 65–82.

Rezazadeh, M., & Tavakoli, M. (2009). Investigating the relationship among test anxiety, gender, academic achievement and years of study: A case of Iranian EFL university students. *English Language Teaching*, *2*(4), 68-74.

Rhemtulla, M., Brosseau-Liard, P. E., & Savalei, V. (2012). When can categorical variables be treated as continuous? A comparison of robust continuous and categorical SEM estimation methods under suboptimal conditions. *Psychological methods*, *17*(3), 354-373.

Richardson, G. E., Neiger, B. L., Jensen, S., & Kumpfer, K. L. (1990). The resiliency model. *Health Education*, *21*(6), 33-39.

Robinson, M. S., & Alloy, L. B. (2003). Negative cognitive styles and stress-reactive rumination interact to predict depression: A prospective study. *Cognitive Therapy and Research*, *27*(3), 275-291.

Roger, D., de Scremin, L. G., Borril, J., & Forbes, A. (2011). Rumination, Inhibition and Stress: The Construction of A New Scale for Assessing Emotional Style. *Current Psychology*, *30*(3), 234-244.

Roger, D., & Najarian, B. (1989). The construction and validation of a new scale for measuring emotion control. *Personality and Individual Differences*, *10*(8), 845-853.

Roseman, I. J. (2001). A model of appraisal in the emotion system: Integrating theory, research, and applications. In K. R. Scherer, A. Schorr, & T. Johnstone (Eds.), *Appraisal processes in emotion: Theory, methods, research* (pp. 68-91). New York: Oxford University Press

Roseman, I. J., & Smith, C. A. (2001). Appraisal theory: Overview, assumptions, varieties, controversies. In K. R. Scherer, A. Schorr, & T. Johnstone (Eds.), *Appraisal processes in emotion: Theory, methods, research* (pp. 3-19). New York: Oxford University Press

Rosenberg, E. L. (1998). Levels of analysis and the organization of affect. *Review of General Psychology*, 2, 247–270.

References

Rusting, C. L. (1998). Personality, mood, and cognitive processing of emotional information: three conceptual frameworks. *Psychological Bulletin*, *124*(2), 165-196.

Rusting, C. L. & Larsen, R. J. (1998). Personality and cognitive processing of affective information. *Personality and Social Psychology, 24*, 200-213.

Ruthig, J. C., Perry, R. P., Hall, N. C., & Hladkyj, S. (2004). Optimism and Attributional Retraining: Longitudinal Effects on Academic Achievement, Test Anxiety, and Voluntary Course Withdrawal in College Students1. *Journal of Applied Social Psychology*, *34*(4), 709-730.

Rutter, M. (1985). Resilience in the face of adversity. *British Journal of Psychiatry*, *147*(1), 598-611.

Rutter, M. (1987). Psychosocial resilience and protective mechanisms. *American Journal of Orthopsychiatry*, *57*(3), 316-331.

Rutter, M. (2007). Resilience, competence and coping. *Child Abuse and Neglect*, *31*, 205-209.

Ryff, C. D. (1989). Happiness is everything, or is it? Explorations on the meaning of psychological well-being. *Journal of Personality and Social Psychology*, *57*(6), 1069-1081.

Ryff, C. D., & Keyes, C. L. M. (1995). The structure of psychological well-being revisited. *Journal of Personality and Social Psychology*, *69*(4), 719-727.

References

Salisbury, W. D., Pearson, R. A., Pearson, A. W., & Miller, D. W. (2001). Perceived
  security and World Wide Web purchase intention. *Industrial Management &
  Data Systems*, *101*(4), 165-177.

Salsman, J. M., Segerstrom, S. C., Brechting, E. H., Carlson, C. R. and Andrykowski,
  M. A. (2009), Posttraumatic growth and PTSD symptomatology among
  colorectal cancer survivors: a 3-month longitudinal examination of cognitive
  processing. *Psycho-Oncology, 18*, 30–41

Salthouse, T. A., & Hedden, T. (2002). Interpreting reaction time measures in
  between-group comparisons. *Journal of Clinical and Experimental
  Neuropsychology*, *24*(7), 858-872.

Samaniego, R. Y., & Gonzales, N. A. (1999). Multiple mediators of the effects of
  acculturation status on delinquency for Mexican American adolescents.
  American Journal of Community Psychology, *27*(2), 189-210.

Schaefer, S. M., Jackson, D. C., Davidson, R. J., Kimberg, D. Y., & Thompson-
  Schill, S. L. (2000, November). *Amygdala activity is modulated by conscious
  maintenance of negative emotion*. Paper presented at the Annual Meeting of the
  Society for Neuroscience.

Schaufeli, W. B., Martínez, I. M., Pinto, A. M., Salanova, M., & Bakker, A. B.
  (2002). Burnout and engagement in university students a cross-national
  study.*Journal of Cross-cultural Psychology*, *33*(5), 464-481.

References

Scheier, M. F., & Carver, C. S. (1993). On the power of positive thinking: The benefits of being optimistic. *Current Directions in Psychological Science*, 26-30.

Scheier, M. F., Carver, C. S., & Bridges, M. W. (1994). Distinguishing optimism from neuroticism (and trait anxiety, self-mastery, and self-esteem): a reevaluation of the Life Orientation Test. *Journal of Personality and Social Psychology*, *67*(6), 1063-1078.

Scheier, M. F., Carver, C. S. & Bridges, M. W. (2000). Optimism, Pessimism, and Psychological Well-Being. In E.C Chang (Eds.), *Optimism and Pessimism: Implications for theory* (pp. 189-216). Washington, DC: American Psychological Association.

Schok, M. L., Kleber, R. J., & Lensvelt-Mulders, G. J. (2010). A model of resilience and meaning after military deployment: Personal resources in making sense of war and peacekeeping experiences. *Aging & Mental Health*, *14*(3), 328-338.

Schmitt, T. A. (2011). Current methodological considerations in exploratory and confirmatory factor analysis. *Journal of Psychoeducational Assessment*, *29*(4), 304-321.

Schneider, F., Gur, R. C., Gur, R. E., & Muenz, L. R. (1994). Standardised mood induction with happy and sad facial expressions. *Psychiatry Research*,*51*(1), 19-31.

Schneider, W., Eschmann, A., & Zuccolotto, A. (2002). *E-Prime reference guide*. Pittsburgh, PA: Psychology Software Tools, Inc.

Schreiber, J. B., Nora, A., Stage, F. K., Barlow, E. A., & King, J. (2006). Reporting structural equation modeling and confirmatory factor analysis results: A review. *The Journal of Educational Research*, *99*(6), 323-338.

Scott, P. M., Martin, F. S. & Charles, T. L. (1991) Academic Locus of Control, Self-Esteem, and Perceived Distance From Home as Predictors of College Adjustment. *Journal of Counseling & Development 69*, 445-448. Segerstrom, S. C., Stanton, A. L., Alden, L. E., & Shortridge, B. E. (2003). A multidimensional structure for repetitive thought: what's on your mind, and how, and how much?. *Journal of Personality and Social Psychology*, *85*(5), 909-921.

Segerstrom, S. C., Tsao, J. C. I., Alden, L. E., & Craske, M. G. (2000). Worry and rumination: Repetitive thought as a concomitant and predictor of negative mood. *Cognitive Therapy and Research, 24*, 671–688.

Seligman M.E.P. (2006). *Learned Optimism*. New York: Vintage Books.

Sexton, M. B., Byrd, M. R., & von Kluge, S. (2010). Measuring resilience in women experiencing infertility using the CD-RISC: Examining infertility-related stress, general distress, and coping styles. *Journal of Psychiatric Research*,*44*(4), 236-241.

Shiota, M. N., Keltner, D. & John, O. P. (2006). Positive emotion dispositions differentially associated with Big Five personality and attachment style. *Journal of Personality Psychology, 1*, 61-71.

References

Shrout, P. E., & Bolger, N. (2002). Mediation in experimental and nonexperimental

    studies: new procedures and recommendations. *Psychological Methods*, *7*(4),

    422-445

Siegle, G. J., Moore, P. M., & Thase, M. E. (2004). Rumination: One construct, many

    features in healthy individuals, depressed individuals, and individuals with

    lupus. *Cognitive Therapy and Research*, *28*(5), 645-668.

Simon, M. A., & Tovar, E. (2004). Confirmatory factor analysis of the Career Factors

    Inventory on a community college sample. *Journal of Career Assessment*, *12*(3),

    255-269.

Singer, J. A. (2004). Narrative identity and meaning making across the adult lifespan:

    An introduction. *Journal of Personality*, *72*(3), 437-460.

Slatcher, R. B., Chung, C. K., Pennebaker, J. W., & Stone, L. D. (2007). Winning

    words: Individual differences in linguistic style among US presidential and vice

    presidential candidates. *Journal of Research in Personality*, *41*(1), 63-75.

Smith, J. M., & Alloy, L. B. (2009). A roadmap to rumination: A review of the

    definition, assessment, and conceptualization of this multifaceted construct.

    Clinical Psychology Review, *29*(2), 116-128.

Smith, C. A., Haynes, K. N., Lazarus, R. S., & Pope, L. K. (1993). In search of the"

    hot" cognitions: attributions, appraisals, and their relation to emotion. *Journal of*

    Personality and Social Psychology, *65*(5), 916-929.

Smits, D. J., & Kuppens, P. (2005). The relations between anger, coping with anger, and aggression, and the BIS/BAS system. *Personality and Individual Differences*, *39*(4), 783-793.

Smith, C. A., & Lazarus, R. S. (1993). Appraisal components, core relational themes, and the emotions. *Cognition & Emotion*, *7*(3-4), 233-269.

Smith, J. S., & Wertlieb, E. C. (2005). Do first-year college students' expectations align with their first-year experiences. *Journal of Student Affairs Research and Practice, 42*(2), 409–524

Solomon, Z., Berger, R., & Ginzburg, K. (2007). Resilience of Israeli body handlers: Implications of repressive coping style. *Traumatology: An International Journal*, *13*(4), 64-74.

Spielberger, C.D. (1979). *Preliminary manual for the State-Trait Personality Inventory*. Unpublished manual, University of South Florida, Tampa.

Spielberger, C. D. (1999). *Professional manual for the State-Trait Anger Expression Inventory-2: STAXI-2*. Psychological Assessment Resources.

Spielberger, C. D., Gorsuch, R. L. & Lushene, R. (1970). *The State-Trait Anxiety (STAI) test manual for Form X*. Palo Ato, CA: Consulting Psychologists Press.

Spielberger, C. D., Gorsuch, R. L., Lushene, R., Vagg, P. R., & Jacobs, G. A. (1983). *Manual for the State-Trait Anxiety Inventory*. Palo Alto, CA: Consulting Psychologists Press

Spielberger, C. D., Krasner, S. S., & Solomon, E. P. (1988). The experience, expression, and control of anger. In In M.P. Janisse (Ed.), *Health Psychology: Individual differences, Stress, and Health Psychology* (pp. 89-108). Springer New York.

Spielberger, C. D., Reheiser, E. C., & Sydeman, S. J. (1995). Measuring the experience, expression, and control of anger. *Issues in Comprehensive Pediatric Nursing*, *18*(3), 207-232.

Spielberger, C. D., & Sydeman, S. J. (1994). State-Trait Anxiety Inventory and State-Trait Anger Expression Inventory. In M.E. Maruish (Ed.), *The use of psychological testing for treatment planning and outcome assessment* (pp. 292-321). Hillsdale, NJ: Lawrence Erlbaum Associates.

Spitzer, W. O., Dobson, A. J., Hall, J., Chesterman, E., Levi, J., Shepherd, R ., Battista, R. N. & Catchlove, B. R. (1981). Measuring the quality of life of cancer patients: a concise QL-index for use by physicians. *Journal of Chronic Diseases*, *34*(12), 585-597.

Stallman, H. M. (2010). Psychological distress in university students: A comparison with general population data. *Australian Psychologist*, *45*(4), 249-257.

Stallman, H. M. (2011). Embedding resilience within the tertiary curriculum: A feasibility study. *Higher Education Research & Development*, *30*(2), 121-133.

Starcevic, V., Berle, D., Milicevic, D., Hannan, A., Lamplugh, C., & Eslick, G. D. (2007). Pathological worry, anxiety disorders and the impact of co-occurrence

with depressive and other anxiety disorders. *Journal of Anxiety Disorders*, *21*(8), 1016-1027.

Stephenson, G. M., Laszlo, J., Ehmann, B., Lefever, R. M., & Lefever, R. (1997). Diaries of significant events: socio-linguistic correlates of therapeutic outcomes in patients with addiction problems. *Journal of Community & Applied Social Psychology*, *7*(5), 389-411.

Stewart, S. M., Betson, C., Lam, T. H., Marshall, I. B., Lee, P. W. H., & Wong, C. M. (1997). Predicting stress in first year medical students: a longitudinal study. *Medical Education*, *31*(3), 163-168.

Stöber, J. (1998). Worry, problem elaboration and suppression of imagery: The role of concreteness. *Behaviour Research and Therapy*, *36*, 751–756.

Stöber J. (2000). Prospective cognitions in anxiety and depression: replication and methodological extension. *Cognition & Emotion, 14*(5), 725–729.

Stöber, J., & Joormann, J. (2001). Worry, procrastination, and perfectionism: Differentiating amount of worry, pathological worry, anxiety, and depression. *Cognitive Therapy and Research*, *25*(1), 49-60.

Strain, J. J., & Friedman, M. J. (2011). Considering adjustment disorders as stress response syndromes for DSM-5. *Depression and Anxiety*, *28*(9), 818-823.

Struthers, C. W., Perry, R. P., & Menec, V. H. (2000). An examination of the relationship among academic stress, coping, motivation, and performance in college. *Research in Higher Education*, *41*(5), 581-592.

Tabachnick, B. G., & Fidell, L. S. (2007). *Experimental designs using ANOVA*. Florence: Cengage Learning.

Tallis, F., Eysenck, M., & Mathews, A. (1992). A questionnaire for the measurement of nonpathological worry. *Personality and Individual Differences*,*13*(2), 161-168.

Tafrate, R. C., Kassinove, H., & Dundin, L. (2002). Anger episodes in high-and low-trait-anger community adults. *Journal of Clinical Psychology*, *58*(12), 1573-1590.

Tao, S., Dong, Q., Pratt, M. W., Hunsberger, B., & Pancer, S. M. (2000). Social Support Relations to Coping and Adjustment During the Transition to University in the People's Republic of China. *Journal of Adolescent Research*,*15*(1), 123-144.

Tausczik, Y. R., & Pennebaker, J. W. (2010). The psychological meaning of words: LIWC and computerized text analysis methods. *Journal of Language and Social Psychology*, *29*(1), 24-54.

Taylor, S. E. (1983). Adjustment to threatening events: A theory of cognitive adaptation. *American Psychologist, 38,* 1161-1173.

Taylor, Z. E., Larsen-Rife, D., Conger, R. D., Widaman, K. F., & Cutrona, C. E. (2010). Life stress, maternal optimism, and adolescent competence in single mother, African American families. *Journal of Family Psychology*, *24*(4), 468-477.

Tedeschi, R. G., & Calhoun, L. G. (2004). Posttraumatic Growth: Conceptual Foundations and Empirical Evidence. *Psychological Inquiry*, *15*(1), 1-18.

Terenzini, P., Rendon, L., Upcraft, M., Millar, J., Allison, K., Gregg, P., & Jalomo, R. (1994). The transition to college: Diverse students, diverse stories. *Research in Higher Education*, *30*, 301-315

Tiet, Q. Q., Huizinga, D., & Byrnes, H. F. (2010). Predictors of resilience among inner city youths. *Journal of Child and Family Studies*, *19*(3), 360-378.

Tugade, M. M., Fredrickson, B. L., & Feldman Barrett, L. (2004). Psychological resilience and positive emotional granularity: Examining the benefits of positive emotions on coping and health. *Journal of Personality*, *72*(6), 1161-1190.

University of Cambridge. (2012). Undergraduate Admissions Statistics. Retrieved from http://www.study.cam.ac.uk/undergraduate/publications/docs/admissionsstatistics2012.pdf.

University of York. (2011). Equality and Diversity Annual Report. Retrieved from http://www.york.ac.uk/admin/eo/annual%20report%202011-12/AnnualReportCouncil.pdf.

Updegraff, J. A., Silver, R. C., & Holman, E. A. (2008). Searching for and finding meaning in collective trauma: results from a national longitudinal study of the 9/11 terrorist attacks. *Journal of Personality and Social Psychology*, *95*(3), 709-722.

Urry, H. L., Nitschke, J. B., Dolski, I., Jackson, D. C., Dalton, K. M., Mueller, C. J., Rosenkranz, M. A., Ryff, C. D., Singer, B. H. & Davidson, R. J. (2004). Making a life worth living neural correlates of well-being. *Psychological Science*, *15*(6), 367-372.

Utsey, S. O., Bolden, M. A., Lanier, Y., & Williams, O. (2007). Examining the role of culture-specific coping as a predictor of resilient outcomes in African Americans from high-risk urban communities. *Journal of Black Psychology*,*33*(1), 75-93.

Warbah, L., Sathiyaseelan, M., VijayaKumar, C., Vasantharaj, B., Russell, S., & Jacob, K. S. (2007). Psychological distress, personality, and adjustment among nursing students. *Nurse education today*, *27*(6), 597-601

Watkins, E. R. (2008). Constructive and unconstructive repetitive thought. *Psychological Bulletin*, *134*(2), 163-206.

Watkins, E., & Teasdale, J. D. (2004). Adaptive and maladaptive self-focus in depression. *Journal of Affective Disorders*, *82*(1), 1-8.

Watson, D., & Clark, L. A. (1984). Negative affectivity: the disposition to experience aversive emotional states. *Psychological Bulletin*, *96*(3), 465-490.

References

Watson, D., & Tellegen, A. (1985). Toward a consensual structure of mood. *Psychological Bulletin*, *98*(2), 219-235.

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: the PANAS scales. *Journal of Personality and Social Psychology*, *54*(6), 1063-1070.

Weissberg, N. C., Owen, D. R., Jenkins, A. H., & Harburg, E. (2003). The incremental variance problem: enhancing the predictability of academic success in an urban, commuter institution. *Genetic, Social, and General Psychology Monographs, 129*(2), 153-180

Wiedemann, A. U., Schüz, B., Sniehotta, F., Scholz, U., & Schwarzer, R. (2009). Disentangling the relation between intentions, planning, and behaviour: A moderated mediation analysis. *Psychology and Health*, *24*(1), 67-79.

Wilcox, P., Winn, S., & Fyvie-Gauld, M. (2005). 'It was nothing to do with the university, it was just the people': the role of social support in the first-year experience of higher education. *Studies in Higher Education*, *30*(6), 707-722.

Wilkowski, B. M., & Robinson, M. D. (2008). The cognitive basis of trait anger and reactive aggression: An integrative analysis. *Personality and Social Psychology Review*, *12*(1), 3-21.

Wilks, S. E. (2008). Resilience amid academic stress: The moderating impact of social support among social work students. *Advances in Social Work*, *9*(2), 106-125.

Wintre, M. G., & Yaffe, M. (2000). First-year students' adjustment to university life as a function of relationships with parents. *Journal of Adolescent Research*,*15*(1), 9-37.

Wood, J. V., Heimpel, S. A. & Michela, J. L. (2003). Savouring versus dampening: Self-esteem differences in regulating positive affect. *Journal of Personality and Social Psychology, 85*, 566-580.

Zhang, C. Q., Chung, P. K., Si, G., & Liu, J. D. (2014). Psychometric Properties of the Acceptance and Action Questionnaire–II for Chinese College Students and Elite Chinese Athletes. *Measurement and Evaluation in Counseling and Development*, 1-15.

Zhu, W. (1997). Making bootstrap statistical inferences: a tutorial. *Research Quarterly for Exercise and Sport*, *68*(1), 44-55.

Zimmerman, M., & Coryell, W. (1987). The Inventory to Diagnose Depression (IDD): A self-report scale to diagnose major depressive disorder. *Journal of Consulting and Clinical Psychology*, *55*(1), 55-59.