

Investigations into Emotional Intelligence

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Abstract

It has been well established that individuals with higher trait emotional intelligence (TEI) experience superior psychological health. Research has also shown that TEI predicts less of an acute stress reaction following a discrete stressor, though this is not invariant across stressors. Further, while it is known that adaptive cognitive and behavioural domains of coping styles and emotion regulation (ER) are associated with TEI, it is not known whether these domains can explain the predictive effect of TEI on psychological health, and thus act as potential mechanisms to explain the apparent benefit of the dispositional construct of TEI. Finally, it is not known whether these effects are consistent across different measures of TEI. Across five studies, this thesis aimed to investigate (1) what systematic differences exist among TEI measurement tools; (2) whether coping styles and ER strategies, particularly cognitive reappraisal, can explain the association between TEI and psychological health and reactions to stress; (3) whether types of reappraisal can be identified and classified according to a theoretically coherent framework; and (4) whether different types of reappraisal moderate the effect of TEI on stress responses differentially. Results showed important differences between TEI measurement tools in associations with personality, distress, coping and ER, suggesting disunity within the TEI construct as operationalised by different researchers. Second, coping styles primarily explain why high TEI individuals experience lower general stress and anxiety, but that greater use of reappraisal by high TEI individuals is key to an apparent adaptive increase in stress when facing a high-demand task, while anxiety remains low. A distinction between two types of reappraisal was established, which had distinctive effects on individuals' acute stress response, and differentially moderated the effect of TEI on acute stress responses. Thus, this thesis showed that, assisted by using reappraisal, high TEI individuals seemingly have the capability to engage more thoroughly with the realistic demands of stressful life events, which, while initially more taxing, is ultimately beneficial.

Statement of Candidature

I certify that the work in this thesis entitled “Investigations into Emotional Intelligence” has not previously been submitted for a higher degree to any other university or institution other than Macquarie University.

I also certify that any sources of information used throughout the thesis are acknowledged, including any help or assistance that I have received in my work and preparation of this thesis.

The research presented in this thesis was reviewed and approved by the Macquarie University Human Research Ethics Committee, reference numbers: HE27NOV2009-D00202, 5201100740, 5201100094, 5201300159, 5201300810, and 5201400340.

Alissa Beath (40722805)

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Thesis by Publication

This thesis has been prepared in the Macquarie University ‘thesis by publication’ format. Chapters two through six have been written and prepared as independent publications. Given this, there is some overlap in the literature cited and some unavoidable repetition across chapters, although I have tried to minimise this as much as possible. The formatting of the chapters generally conforms to the Publication Manual of the APA, 6th edition, although tables and figures are inserted within the manuscripts, and chapters are cross-referenced to assist with readability of the thesis. Before each manuscript, there is a brief introductory section that provides a rationale for the study in the context of the thesis, and which also details the individual contributions of myself and co-authors.

Chapter 1. Introduction

Thesis Overview

Much interest in the construct of trait emotional intelligence (TEI) has been due to its theorised and empirically demonstrated benefit for understanding individual variations in psychological health (Austin, Saklofske, & Mastoras, 2010; Chamorro-Premuzic, Bennett, & Furnham, 2007; Ciarrochi, Dean, & Anderson, 2002). While these associations have consistent empirical support, the mechanisms through which TEI might act on both general psychological health and specific reactions to stress are still largely unknown. Furthermore, differences in the conceptualisation and measurement of TEI raise questions about the coherence of the TEI construct, and relatedly, whether the aforementioned mechanisms are consistent across measures. The overall aim of this thesis, thus, is to address these questions, and in so doing, to help further clarify the construct of TEI.

According to Petrides and colleagues, TEI comprises a constellation of dispositions and self-reflections relating to an individual's emotions, emotional skills and well-being (Petrides, Pérez-González, & Furnham, 2007). As a dispositional construct, TEI assesses general self-beliefs and tendencies to respond in particular ways over numerous kinds of situations. However, the ways in which TEI, or potentially its facets, predict psychological health is still poorly understood. It is important to consider the potential impact of TEI on more specific, targeted, behavioural domains in order to better understand what makes high TEI individuals different to their low TEI counterparts when facing stressful situations. Accordingly, this thesis will examine both the conceptualisation and the measurement of TEI, along with the mechanisms crucial to understanding its impact on individual reactions to stress, via two, distinct mechanistic paths: coping styles and emotion regulation (ER). Specifically, it will investigate whether high TEI individuals experience greater psychological well-being because of their use of adaptive coping and use of ER strategies. The strategy of cognitive reappraisal will be a particular focus, due to its strong conceptual relevance but lack

of thorough prior empirical investigation, in order to understand whether different ways of utilising reappraisal impact how TEI predicts individual responses to stress.

The general aim of this thesis, then, is to investigate aspects of the dispositional construct of TEI: what is it, what are the different approaches to its measurement, and how does it work? To address these questions, the thesis contains an introduction chapter, five distinct empirical works, and a general concluding chapter. This introduction will begin with a review of the emotional intelligence literature to set the context for the work that follows. The distinction between trait and ability models will be discussed, along with the variety of approaches to TEI theory and measurement¹ that, in turn, provide the setting for the later analysis of the unified versus discrepant nature of the TEI construct. Empirical work that has demonstrated the associations between TEI and psychological health will then be presented, followed by an exploration of two potential explanatory mechanisms for this association: coping styles and ER. In particular, the regulatory strategy of reappraisal will be discussed in detail. Finally, the introduction will end with the overarching aims of the thesis, outline the work that will be presented in each following chapter and establish how, together, it adds to the understanding of how and why TEI can explain individual differences in coping with stress.

Emotional Intelligence

The concept of emotional intelligence has its early roots in Thorndike (1920), Guilford (1967) and Gardner's (1983) respective models of intelligences. However, the first scientific paper to formally propose the modern concept of emotional intelligence as it is used

¹ As will be established in the following section, this thesis utilises the distinction between ability and trait approaches to emotional intelligence. Thus, when the term 'emotional intelligence' is used, reference is being made to both ability and trait models; the term 'TEI' refers specifically to trait emotional intelligence.

² While any ER strategy, including reappraisal, can be used to either up- or down-regulate negative or positive affect (e.g., Gross, 2015), for simplicity this thesis will be focused on down-regulating negative emotion, unless explicitly stated otherwise.

³ By depicting FFM as spatially preceding TEI, this is not to argue that FFM traits developmentally originate before TEI, as much more research is needed to understand and

here was written by Salovey and Mayer (1990), which established emotional intelligence as a set of emotional abilities, including accurate emotion perception, intellectual emotional knowledge and adaptive emotion regulation. Following this paper, the interest in emotional intelligence quickly increased, partly due to popular writing (Goleman, 1995), and resulted in the concept being widely studied and applied to a variety of different areas of social science, including organisational psychology (Cavazotte, Moreno, & Hickmann, 2012; Palmer, Walls, Burgess, & Stough, 2001), nursing (Bulmer Smith, Profetto-McGrath, & Cummings, 2009), sport psychology (Meyer & Fletcher, 2007), educational psychology (Billings, Downey, Lomas, Lloyd, & Stough, 2014; Zeidner, Roberts, & Matthews, 2002), health (Martins, Ramalho, & Morin, 2010), close relationships (Fitness, 2006) and psychological interventions (Ciarrochi & Mayer, 2007; Maddocks, 2007). This increased interest in emotional intelligence resulted in a wider adoption and utilisation of the theory, and there now stand two quite distinct approaches to its measurement and theory; namely, the ability approach, which closely follows Salovey and Mayer's initial proposal of a formal intelligence focused on emotions and emotional skills, and the dispositional or trait approach, which assesses self-perceptions of emotional abilities via self-report.

Ability emotional intelligence is focused on individual emotional information processing skills, and is comprised of four, independent branches of abilities (Mayer, Salovey, & Caruso, 2004): (1) emotion perception and expression: the ability to recognise emotions in one's self and others, and accurately communicate discrete emotions; (2) emotional understanding: the knowledge of the causes, consequences, and correlates of specific emotions; (3) emotional utilisation: how to effectively use emotions and emotion knowledge to assist with decision making; and (4) emotion management: the ability to know when, and how, to effectively regulate emotional experiences. Ability emotional intelligence is measured via a set of maximum-performance tests with correct and incorrect responses

(Mayer, Salovey, Caruso, & Sitarenios, 2003). The higher an individual's ability emotional intelligence, the better able that individual is to deal with emotions; that is, the more accurately they can recognise and manage their own emotions, and effectively handle interpersonal situations which involve the emotions of others.

The second conceptualisation of emotional intelligence and alternate to the ability model is the trait model, which is the focus of this thesis. TEI conceptualises emotional intelligence not in terms of discrete skills, but rather, as a dispositional trait, akin to a personality construct, and which is assessed via self-report. Individuals with high TEI self-report that they are adept at handling their own and others' emotions and emotional reactions (Petrides & Furnham, 2000; Saklofske, Austin, & Minski, 2003; Schutte & Malouff, 1999), but they do not necessarily have superior emotional skills. In fact, there is only a small positive association between individuals' trait and ability emotional intelligence (Joseph & Newman, 2010; van Rooy, Viswesvaran, & Pluta, 2005). Because individual conceptualisations of the TEI construct have been extrapolated from the initial ability emotional intelligence theory, there are substantially more researchers and measurement tools in the TEI field compared to the ability emotional intelligence field (Austin, Saklofske, & Egan, 2005; Bar-On, 1997, 2000; Mikolajczak, Luminet, Leroy, & Roy, 2007; Petrides, Furnham, & Mavroveli, 2007; Schutte et al., 1998).

Approaches to TEI

There is no real consensus in the literature on the specific definition of TEI, nor its potential sub-facets. The following section of the Introduction will review a selection of four TEI conceptualisations (and their corresponding measures) from the literature, though it is by no means exhaustive. These four particular theoretical approaches have been chosen for the present discussion because of their direct impact on the development of the TEI construct, and/or their relevance to the empirical work in this thesis. (A broader discussion of TEI

measures can be found in Chapter 2.) A comparison of the four approaches can be found in Table 1, which summarises the discussion in the following section.

Schutte and colleagues (1998) were among the first TEI theorists. They followed Mayer and Salovey's (1997) skills-based ability framework to guide the theoretical basis of their TEI conceptualisation, which utilised self-report methodology and thus assessed dispositional TEI. They have argued that skill-based emotional intelligence and dispositional emotional intelligence are two independent though related approaches to measurement of the emotional intelligence construct (Schutte & Malouff, 1999; Schutte, Malouff, Simunek, McKenley, & Hollander, 2002). The Assessing Emotions Scale (AES), developed by Schutte et al. (1998), measures an individual's self-perceptions of emotional ability, emotion regulation, and emotional utilisation, both intrapersonally and interpersonally (see Table 1 for the specific dimensions included). While these multiple facets constitute their TEI conceptualisation, Schutte et al. (1998) do not prescribe a formal factor structure for the AES, instead recommending researchers use the single, total, score. Independent researchers have reported a variety of different factor structures for the AES, either confirming the single-factor structure (Gignac, Palmer, Manocha, & Stough, 2005) or reporting three (Austin, Saklofske, Huang, & McKenney, 2004; Kun, Balazs, Kapitany, Urban, & Demetrovics, 2010) or four factor (Petrides & Furnham, 2000; Saklofske et al., 2003) solutions. Despite these discrepancies, the AES remains one of the most commonly-used TEI measures in the literature, as will be demonstrated throughout this thesis.

Petrides and Furnham (2001) arguably formalised the ability-trait emotional intelligence distinction and, while noting that there should be some degree of within-person relationship between the two, proposed a separation of the research between that which investigates "cognitive-emotional ability" (ability emotional intelligence) and that of "emotional self-efficacy" (TEI) (p. 427). They label TEI as emotional self-efficacy (Petrides,

Furnham, & Frederickson, 2004), since it measures individuals' beliefs about, and perceptions of, their own emotional skills and adaptive emotional behaviours. Self-efficacy refers to individuals' assessments of their own capabilities in a particular domain; it involves self-reflection and an evaluation of one's ability to enact or perform a task in a desired way (Bandura, 1977, 1982). The construct of self-efficacy arose from social-cognitive theory, which conceptualises human behaviour as being shaped by an individual's expectations of their self and the world (Bandura, 1989). In TEI, self-efficacy is applied to the emotional domain, assessing individuals' evaluations of their own emotional expression, understanding and regulation (Petrides, Pérez-González, et al., 2007).

Petrides and colleagues formalised their TEI model based not directly on the ability model of emotional intelligence, but rather a broad review of the emotional intelligence literature (Petrides & Furnham, 2001), and the location of TEI in personality factor space, specifically at the lower levels of the personality hierarchy (Petrides, Pita, & Kokkinaki, 2007). They expressed dissatisfaction with existing TEI measures (Petrides & Furnham, 2000), and thus developed the Trait Emotional Intelligence Questionnaire (TEIQue; Petrides, 2009), which they argue is unique in its comprehensive assessment of this domain (Pérez, Petrides, & Furnham, 2005). While the TEIQue includes some facets similar to the AES (e.g., emotional expression, perception and management), it also encompasses broader dispositions such as happiness, self-esteem, and stress management. Schutte, Malouff, and Bhullar (2009) state that that because of this inclusion of broad dispositions in the TEIQue, Petrides and colleagues' conceptualisation of TEI cannot be defined solely as emotional self-efficacy; instead, it must be a combination of emotional self-efficacy and dispositions relating to positive affect.

The Bar-On model of socio-emotional intelligence (Bar-On, 2000, 2006), assessed by the Emotional Quotient inventory (EQ-i; Bar-On, 1997), presents a broader conceptualisation

of TEI than any other. Bar-On's theoretical model comprises "a cross-section of interrelated emotional and social competencies, skills and facilitators that determine how effectively we understand and express ourselves, understand others and relate with them, and cope with daily demands" (Bar-On, 2006, p. 14). Bar-On's model is most similar to Petrides and colleagues', in that it includes broader dispositions such as happiness and optimism, rather than focusing solely on the self-perceptions of emotional abilities like the AES. While there are some facets of the EQ-i that are not included in any other TEI model, such as self-actualisation and independence, it also fails to include some facets that are fundamental to all the other conceptualisations, such as emotion regulation. Given this, the EQ-i is not as central to this thesis compared to the other three TEI scales reviewed here.

The fourth conceptualisation discussed here is the most recent, proposed by Wong and Law (2002). Their TEI model, and subsequent scale, the Wong and Law Emotional Intelligence Scale (WLEIS; Law, Wong, & Song, 2004) is the most specific of those discussed here. Their conceptualisation was developed originally for use in organisational contexts, and was based on Mayer and Salovey's (1997) framework, which, as noted earlier, has four factors: self-emotion appraisal, other-emotion appraisal, use of emotion and emotion regulation. While this framework was developed from their earlier work (Salovey & Mayer, 1990), and the 1990 concepts are what Schutte and colleagues' (1998) AES is based on, Schutte et al. include sub-components of these core ability factors, whereas Wong and Law do not (see Table 1 below), and thus the WLEIS is a more brief and narrow measure of TEI than the AES.

A comparison of facets found in each proposed TEI model can be found in Table 1, which summarises the preceding discussion. This table shows the points of similarities and differences between the theoretical models and measurement tools.

Table 1

Facets of TEI, according to different theorists, arranged from the most targeted on the left to most broad on the right.

TEI theorist			
Wong and Law	Schutte et al.	Petrides and Furnham	Bar-On
Measure			
WLEIS	AES	TEIQue	EQ-i
Facets			
Appraisal and expression of emotion in self	Appraisal and expression of emotion in self (verbal and non-verbal)	Emotion appraisal (self) Emotion expression	Emotional self-awareness Assertiveness
Appraisal and recognition of emotion in others	Appraisal of emotion in others (non-verbal perception and empathy)	Emotion appraisal (others) Trait empathy	Empathy
Regulation of emotion in the self	Own emotion regulation Others' emotion regulation	Emotion regulation Others' emotion management	
Use of emotion to facilitate performance	Flexibility Creative thinking Redirected attention Motivation	Adaptability Self-motivation Social competence Assertiveness Low impulsiveness Stress management Relationship skills Self-esteem Trait happiness Trait optimism	Flexibility Assertiveness Assertiveness Impulse control Stress tolerance Interpersonal relationships Social responsibility Self-regard Happiness Optimism Independence Self-actualization Reality testing

Note. Individual facets have been matched up across models as best as possible, but there is inevitably some overlap (e.g., EQ-i 'assertiveness' is listed multiple times as its definition corresponds to more than one of the facets found in the other models; Bar-On, 2006).

TEI and Personality

Because of its focus on emotional and social traits, TEI has repeatedly been shown to correlate with other measures of personality, particularly those in the five-factor model of personality (FFM). Individuals with high TEI tend to be less neurotic and more extraverted, agreeable, open to experience and conscientious (Petrides & Furnham, 2001; van der Linden, Tsaoasis, & Petrides, 2012; van der Zee & Wabeke, 2004). The size of some of these correlations has led to criticisms that TEI might not be distinct from the FFM (Davies, Stankov, & Roberts, 1998; Mayer, Salovey, & Caruso, 2008). Further, it is likely that there are differences in the degree of these associations depending on what TEI measure is used (Pérez et al., 2005), which is exacerbated by the large number of TEI scales in use in the literature. Such differences suggest that different scales are tapping into different aspects of the TEI construct (Zeidner, Roberts, & Matthews, 2008), reflected in the earlier discussion and demonstration of different facets of TEI models. Given this, Chapter 2 of this thesis presents a meta-analysis of TEI and FFM personality traits, updating previous reviews (Joseph & Newman, 2010; van Rooy et al., 2005) by formally investigating what systematic differences exist between TEI scales. Based on the results of Chapter 2, Chapter 4 then investigates two mechanisms underpinning the association between TEI and psychological health, coping and ER, using three different TEI scales (the TEIQue, AES and WLEIS), to determine whether the different TEI conceptualisations predict different adaptive or maladaptive behaviours, and whether there are differences between scales in their associations with psychological health. The next section of this Introduction will discuss the association between TEI and psychological health in more detail, in order to provide further justification for its exploration throughout the thesis.

TEI and Psychological Health

There are a number of aspects of psychological health that have been associated with TEI. Psychological well-being can be defined as a general evaluative judgement with both cognitive (high life satisfaction) and affective elements (high positive mood, low negative mood) that an individual makes about his or her life (Diener, Lucas, & Oishi, 2002).

Psychological distress, alternatively, is a term used to describe a combination of general dissatisfaction with life and more specific negative affect, such as stress and anxiety (Veit & Ware, 1983). Stress arises in response to a situation that is appraised as both threatening and beyond the individual's resources to cope (Cohen, Kamarck, & Mermelstein, 1983; Lazarus, 1966) and is defined as generalised, chronic arousal associated with impaired functioning (P. F. Lovibond & S. H. Lovibond, 1995). Anxiety is more directly related to that initial appraisal of threat (Epstein, 1972; Öhman, 2008), which manifests as situational worry and fear and high negative physiological arousal (S. H. Lovibond & P. F. Lovibond, 1995).

The positive association between TEI and psychological health is well established: TEI consistently predicts greater life satisfaction and less psychological distress (Chamorro-Premuzic et al., 2007; Landa, Lopez-Zafra, de Antonana, & Pulido, 2006; Palmer, Donaldson, & Stough, 2002; Singh & Woods, 2008). Individuals who feel more in control of their emotions, and believe they have greater impact over other people's emotional experiences, generally experience greater life satisfaction and general well-being. This next section of the Introduction will detail the literature on this association, making a distinction between general psychological health (that is, under no particular stressful circumstances), and specific experiences of stress and anxiety in response to a discrete stressor.

General psychological health. Using correlational research methods, TEI has been positively associated with happiness (Chamorro-Premuzic et al., 2007; Furnham & Christoforou, 2007; Furnham & Petrides, 2003), life satisfaction (Extremera & Fernández-

Berrocal, 2005; Gannon & Ranzijn, 2005; Palmer et al., 2002; Saklofske et al., 2003; Thompson, Waltz, Croyle, & Pepper, 2007), and subjective well-being (Bhullar, Schutte, & Malouff, 2013; Gallagher & Vella-Brodrick, 2008). Research has similarly found TEI to predict lower stress. Kluemper (2008) found a significant negative association between total TEI (measured using the WLEIS) and stress. Two subscales of the trait meta-mood scale (another TEI measure), mood clarity (how understandable and identifiable one's emotions are to the individual) and mood repair (general emotion regulation) have been shown to correlate negatively with perceived stress (Duran, Extremera, Rey, Fernandez-Berrocal, & Montalban, 2006) and anxiety (Salovey, Stroud, Woolery, & Epel, 2002). A meta-analysis of the association between emotional intelligence and various aspects of health (Martins et al., 2010) reported the average correlation between TEI and mental health at $r = .27$, with associations varying between different TEI measurement tools from $r = .25$ to $.53$.

Moderating effects. To further explore this cross-sectional association, some work has explored different circumstances under which TEI might more or less strongly predict psychological health. While there is a propensity for higher TEI individuals to be more satisfied with their lives than those with low TEI, it is also possible that high TEI might be more beneficial at some specific times or in certain situations, or that an individual's TEI might interact with other factors to impact upon their stress response, or indirectly affect stress responses via other factors. This is fundamental to the concept of emotional *intelligence*, the concept that high TEI individuals know how to experience and manage their emotions to their benefit (Bar-On, Tranel, Denburg, & Bechara, 2003; Peña-Sarrionandia, Mikolajczak, & Gross, 2015)

For example, research has investigated the interaction between stress and TEI in predicting mental health. Ciarrochi et al. (2002) found that TEI moderated the relationship between stress and suicidal ideation. For individuals with low TEI (in particular, low

‘managing others’ emotions’ scores), increasing stress was more strongly predictive of greater suicidal ideation; for high TEI individuals, increased stress was less predictive of increased suicidal ideation. This suggests that people with higher TEI respond differently to stressors than those with low TEI. Extremera, Durán, and Rey (2009) found an interaction between mood clarity (how clearly individuals think they understand their emotional states) and perceived stress when predicting life satisfaction. Individuals with low TEI had a larger decrease in satisfaction as their experience of stress increased, compared with individuals with higher TEI, implying that stress has more of a detrimental impact on life satisfaction for individuals with low TEI. This study also found that mood clarity was significantly related to life satisfaction only for individuals experiencing high stress; for low stress individuals, there was no relation between mood clarity and satisfaction with life. Similarly, Bhullar, Schutte, and Malouff (2012) reported that psychological distress predicted decreasing life satisfaction for low TEI individuals only; for high TEI individuals, there was no relationship between psychological distress and life satisfaction. Additionally, TEI and stress appear to interact when predicting self-efficacy. Mikolajczak and Luminet (2008) found that under stressful experimental conditions, high TEI individuals had significantly higher self-efficacy than low TEI individuals. This difference was not evident, however, under neutral conditions. Taken together, these studies show that high TEI individuals are more resilient to stress than their low TEI counterparts, in that the experience of stress is less detrimental for high, than low, TEI individuals, or alternatively, that high TEI is more beneficial under stress.

Reactions to stressors. While the work reviewed above has demonstrated that, first, TEI is predictive of less general stress, and second, that high TEI individuals experience less detrimental effects of stress, there has been mixed evidence for the association between TEI and stress in reaction to a specific stressor. Consistent with the findings above, Mikolajczak and colleagues have consistently demonstrated that high TEI individuals are less negatively

affected by stressful situations. For example, Mikolajczak, Petrides, Coumans, and Luminet (2009) found that high TEI individuals' self-reported positive and negative affect decreased less after a stress induction compared to low TEI individuals. Additionally, Mikolajczak, Luminet, and Menil (2006) found that TEI, and particularly the self-control factor, predicted psychological and somatic symptoms in individuals in the midst of university examinations, controlling for baseline scores at the start of semester.

In contrast, though, Sevdalis, Petrides, and Harvey (2007) found that while TEI predicted a more positive mood at baseline, after individuals were cued to recall a previously-made bad decision, compared to low TEI individuals, high TEI individuals actually experienced a *greater* increase in negative affect. Similarly, Petrides and Furnham (2003) concluded that high TEI individuals experienced a greater increase in negative affect after watching a disturbing film clip, though the particular analyses reported in their paper give rise to a cautious interpretation of these findings. The studies by Mikolajczak and colleagues as well as those by Sedvalis et al. and Petrides and Furnham all used the TEIQue to measure TEI, and therefore the discrepancy in results cannot be due to differences among TEI measures.

Various studies investigating physiological stress responses have reported some contradictory results as well. Most physiological work has shown that higher TEI is predictive of a weaker physiological stress response when under pressure. Mikolajczak, Roy, Luminet, Fillée, and de Timary (2007) found TEI to be predictive of lower biological and physiological stress responses (that is, changes in physiological responses to stress over time). Additionally, Salovey et al. (2002) found that higher emotion attention scores predicted lower cortisol (a biological stress hormone) and systolic blood pressure (a physiological marker of stress) under stress, and that mood clarity (understanding distinct emotional states) predicted lower total cortisol responses overall. However, in the same study, Salovey and colleagues

reported that (controlling for baseline measures) higher dispositional ER scores predicted *more* cortisol at the start of the last day of a three day repeated stress study, suggesting that those who report high dispositional ER experienced a greater anticipatory stress response.

Summary. Taken together, previous work has consistently shown that TEI can predict greater general psychological health (e.g., Bhullar et al., 2013). However, when assessing reactions to a specific stressor, most work shows a protective effect of TEI (i.e., a lower stress response), but some suggests high TEI predicts increased stress under certain circumstances (Salovey et al., 2002; Sevdalis et al., 2007). Research consistently shows that high TEI individuals are less negatively affected by experiences of stress, though. This thesis will investigate how TEI predicts (a) general psychological distress (in Chapter 4), and (b) reactions to a stressor longitudinally (in Chapter 3) and experimentally (in Chapter 6), to try to better understand *when* TEI predicts psychological health.

Mechanisms of TEI

The next question that this thesis will address is *why* TEI predicts psychological health. What might explain this association? Given that the dispositional nature of TEI, as discussed earlier, reflects general emotional tendencies, this thesis will investigate whether high TEI individuals are more likely than low TEI individuals to engage in beneficial behaviours or strategies when experiencing stress, in order to lessen distress. In particular, the behavioural domains of interest to this thesis are coping styles and ER. Both are theoretically and empirically related to TEI, as will be discussed below, and thus are both relevant to consider in the association between TEI and psychological health.

Coping Styles

The coping styles literature arose in order to explain individual differences in stress and well-being, and to investigate why it is that some individuals cope with stressful life events better than others (Folkman, Lazarus, Dunkel-Schetter, DeLongis, & Gruen, 1986).

Coping styles comprise distinct groups of physical and cognitive behaviours or strategies that individuals engage in when under pressure or when faced with stressful situations (Carver, Scheier, & Weintraub, 1989). There are two general approaches to classifying coping styles in the literature: using a larger number of more specific coping styles, or using fewer coping classifications that have grouped some of the more specific styles together. Carver and colleagues (1989) take the first approach, and differentiate between specific types of coping such as planning (e.g., thinking about what specific steps to take), suppression of competing activities (putting aside other activities in order to focus on the problem at hand), restraint (e.g., not rushing into action) and behavioural disengagement (e.g., giving up trying to reach the goal). Alternatively, the less specific approach tends to use three higher-order types or styles: active or problem-focused coping, emotion-focused coping, and avoidant coping (e.g., (Austenfeld & Stanton, 2004; Ben-Zur, 2009; Lyne & Roger, 2000). Problem-focused coping strategies require the individual to engage with practical aspects of the situation in order to deal with the problem, and are generally beneficial for the individual (Frydenberg & Lewis, 2009). Emotion-focused coping involves emotional responses to the situation, which can involve venting negative emotions and/or seeking external emotional support, and is either beneficial or detrimental to the individual, depending on *how*, specifically, emotions are engaged with (Austenfeld & Stanton, 2004). Finally, avoidant coping involves avoiding or withdrawing from the situation either cognitively (by using distraction) and/or behaviourally (e.g., via behavioural disengagement or using drugs or alcohol), which tends to be detrimental to the individual (Carver, Scheier, & Fulford, 2008).

Coping and TEI. High TEI individuals have repeatedly been shown to report using more adaptive, problem-focused coping, and less avoidant coping, both generally and in the presence of specific stressors (e.g. Alumran & Punamaki, 2008; Bastian, Burns, & Nettelbeck, 2005; Matthews et al., 2006). In fact, work by Austin, Saklofske and colleagues

has used factor analytic techniques to group TEI and coping styles together, viewing TEI as a component of coping (Saklofske, Austin, Mastoras, Beaton, & Osborne, 2012). In a longitudinal design that built on a previous study of theirs (Saklofske, Austin, Galloway, & Davidson, 2007), Austin and colleagues (2010) investigated the effects of personality, coping and TEI on experiences of university exam stress. Composite factors of TEI and coping styles, along with personality, successfully predicted both subjective well-being and perceived stress at multiple time points throughout the academic year (see also Saklofske et al., 2012). This thesis, however, has approached coping as a potential mechanism to explain the effect of TEI, given the more specific nature of how coping is operationalized and more targeted behaviours and strategies measured, as opposed to the comparatively broader nature of TEI. Further, a recognised function of coping behaviours is to regulate emotional responses (Folkman et al., 1986), thus putting coping on par with specific emotion regulation strategies to be discussed in the next section. Given this, Chapters 3 and 4 will investigate whether coping can explain the effect of TEI on both cross-sectional psychological distress (Chapter 4) and changes in distress over time (Chapter 3). These chapters will also compare the potential explanatory power of coping with other emotion regulation strategies, which are discussed now.

Emotion Regulation

Along with coping, this thesis will investigate whether emotion regulation strategies are potentially useful in explaining why TEI is beneficial in explaining psychological health. Individuals differ in how they manage, or regulate, their emotions in any particular situation, and the field of ER encapsulates a wide variety of specific skills and strategies (see, e.g., Augustine & Hemenover, 2009; Gross, 1998; Nyklicek, Vingerhoets, & Zeelenberg, 2011) of which the main focus in this thesis is cognitive reappraisal. The next section of the

Introduction will discuss cognitive reappraisal and its associations with psychological health and TEI.

Cognitive reappraisal. Reappraisal refers to the act of changing the way one interprets, or appraises, an emotion-eliciting event, in order to change one's emotional experience (McRae, Ochsner, & Gross, 2011). The appraisal theory of emotion argues that the interpretation and evaluation of any particular situation will dictate the type of the emotion and how it is experienced: Once the individual attends to the present circumstance, the interpretation, or appraisal, that they make of that circumstance will bring about their particular emotional experience, which is comprised of both physiological and cognitive components (Brans & Verduyn, 2014; Frijda, 1986; Moors, Ellsworth, Scherer, & Frijda, 2013). The physiological experience and cognitive-evaluative component of the emotion then feed back on each other to create an evolving, fluid experience for the individual, and the type and level of appraisal that the individual makes will change as the emotion experience unfolds (Ellsworth & Scherer, 2003; Scherer, 2000). Cognitive reappraisal thus targets this appraisal of the circumstance in order to directly change the resulting affective experience (Gross & Thompson, 2007; Jamieson, Mendes, & Nock, 2013).

While the benefit of any ER strategy is context-specific, depending on individual goals and situation-specific details (Aldao, 2013; Kalisch, 2009), research has shown that in many contexts, reappraisal is particularly efficient for down-regulating unwanted negative affect, and is thus a beneficial ER strategy across many contexts² (Ray, McRae, Ochsner, & Gross, 2010; Urry, 2009). As reappraisal typically occurs relatively early in the experience of any given emotion as previously explained, the change it enacts not only alters the experience of emotion quite effectively, lessening negative affect, but saves the individual from exerting

² While any ER strategy, including reappraisal, can be used to either up- or down-regulate negative or positive affect (e.g., Gross, 2015), for simplicity this thesis will be focused on down-regulating negative emotion, unless explicitly stated otherwise.

additional cognitive effort compared to other ER strategies, particularly those that occur after the emotion has been initially experienced (Gross, 2001), and thus lessens negative affect and physiological stress responses (Gross & John, 2003; Jamieson et al., 2013; Ray et al., 2010) as well as decreases the negative effects of stress (Troy, Wilhelm, Shallcross, & Mauss, 2010)

Empirical work into cognitive reappraisal has tended to use one of three different approaches to measuring reappraisal. First, and the most common, is instructed reappraisal, where the participant is given explicit instructions to use reappraisal in response to an experimental stressor to lessen negative affect (Gross, 2002; McRae, Ciesielski, & Gross, 2012; Shiota & Levenson, 2012). Second, researchers can measure spontaneous use of reappraisal, where an individual is asked after a stressful task whether they used reappraisal to lessen their negative affect, without being given explicit instructions to use it beforehand (Egloff, Schmukle, Burns, & Schwerdtfeger, 2006; Ehring, Tuschen-Caffier, Schnülle, Fischer, & Gross, 2010). Finally, researchers can investigate dispositional or typical reappraisal, which measures individuals' general tendency to use reappraisal when wanting to regulate their emotional response, not in the context of in any specific emotion-eliciting situation (Drabant, McRae, Manuck, Hariri, & Gross, 2009; Spaapen, Waters, Brummer, Stopa, & Bucks, 2014). This thesis will assess typical reappraisal in Chapters 3 and 4, and instructed reappraisal in Chapter 6, as well as qualitative research methods in Chapter 5, in order to more fully explore reappraisal and its relationship with TEI.

Reappraisal and TEI. Conceptually, emotional intelligence and ER are closely associated (Barrett & Gross, 2001; Peña-Sarrionandia et al., 2015), as self-perceptions of ER skills are a major aspect of TEI, and most TEI measurement scales have a distinct emotion regulation factor. Previous research has shown that higher TEI is associated with a more benign, less threatening initial appraisal of a potentially stressful discrete situation (Salovey et al., 2002), which results in lessened psychological distress in response to the stressor

(Mikolajczak et al., 2006). Emotion-specific regulation skills have been found to mediate the relationship between TEI and emotional experiences of joy, sadness, anger and envy (Mikolajczak, Nelis, Hansenne, & Quoidbach, 2008), and positive associations have been found between TEI and dispositional reappraisal use (Cabello, Salguero, Fernández-Berrocal, & Gross, 2013; Mikolajczak et al., 2008; Schutte, Manes, & Malouff, 2009). Finally, a recent meta-analysis demonstrated consistent relationships between TEI and multiple ER strategies (Peña-Sarrionandia et al., 2015). Given this, the present thesis examines whether specific emotion regulation strategies, including reappraisal, may help to explain the links between TEI and psychological distress (Chapter 4), individuals' reactions to stress (Chapter 3), and whether TEI and reappraisal interact to predict stress responses (Chapter 6).

Types of reappraisal. Given that reappraisal has been shown to benefit both experienced affect and physiological stress responses, it is worthwhile to investigate more specifically the types of reappraisal that can be utilised, in order to better understand how TEI relates to reappraisal. Measures of typical reappraisal define it very broadly (e.g., an item from the Emotion Regulation Questionnaire, the most commonly used measure of typical reappraisal, is “when I want to feel less *negative* emotion (such as sadness or anger), I *change what I’m thinking about*”; Gross & John, 2003, p. 351), and experimental reappraisal instructions tend to be phrased similarly (e.g., “think about the picture in a way that decreases your negative response”; Ray et al., 2010, p. 588). Recently, there have been two independent attempts at categorising types of reappraisal: Shiota and Levenson (2012) made a distinction between detached versus positive reappraisal, and McRae et al. (2012) proposed eight distinct reappraisal tactics. While both of these are important steps, what is missing is a framework to classify reappraisal that integrates these previous attempts in a theoretically coherent manner. Thus, Chapter 5 will present a conceptual and empirical analysis of types of reappraisal, and Chapter 6 will test the categorization made in Chapter 5 to compare the efficacy of the types

of reappraisal. Chapter 6 will also investigate whether TEI impacts the effect of reappraisal differently between the two types, further exploring the question of how TEI predicts individual reactions to stress.

Aims of the Thesis

In summary, previous research has consistently shown that TEI can explain individual differences in psychological health, predicting lower general distress and greater well-being (e.g., Bhullar et al., 2013). In the context of a particular stressor, most past research has shown TEI to be predictive of a weaker reaction to stress (e.g., Mikolajczak et al., 2009), though some work has suggested that high TEI individuals experience a stronger stress response (Sevdalis et al., 2007). Even so, high TEI individuals seem less negatively affected by experiences of stress (Extremera et al., 2009). Further, research has repeatedly demonstrated the association between TEI and the use of adaptive coping styles (Saklofske et al., 2012) and is beginning to show the same with adaptive ER strategies, especially reappraisal (Peña-Sarrionandia et al., 2015). To date, though, no work has compared coping and ER in terms of whether they can explain the association between TEI and psychological distress. Finally, differences in theoretical definitions of TEI have resulted in variation between TEI measurement tools in terms of the facets of TEI included (see Table 1), by which scales are potentially assessing different aspects of TEI. This is problematic, as different TEI scales might be associated to different degrees with other constructs of interest. For example, there is evidence that the associations between TEI and mental health vary between TEI scales (Martins et al., 2010).

Thus, this thesis will present five distinct empirical works that, together, explore the measurement and predictive utility of TEI. In order to more thoroughly understand how TEI is beneficial in response to stress, it will investigate two potential mechanisms: coping styles and ER, particularly reappraisal. Furthermore, in order to properly investigate the role that

reappraisal plays in the benefit of TEI, given the lack of research in the area, it will present a detailed conceptual and empirical analysis of reappraisal, developing and proposing a framework of sub-types of reappraisal to integrate previous work in the field in a theoretically coherent manner.

By reviewing the extant literature throughout this Introduction, it has been shown that: low neuroticism and high extraversion, openness, conscientiousness and agreeableness predict higher TEI; higher TEI predicts greater use of adaptive ER strategies (such as reappraisal) and, separately, adaptive coping (more active, less avoidant, coping); higher TEI predicts greater psychological health and adaptive reactions to stress; and, adaptive coping and reappraisal also predict greater psychological health and lower reactions to stress. The central focus of this thesis is to integrate these associations, specifically proposing that TEI predicts adaptive reactions to stressors and greater psychological health via the use of adaptive coping and reappraisal, as depicted in the model in Figure 1.

Figure 1, presented below, conceptualises and summarises the different aims of the thesis.

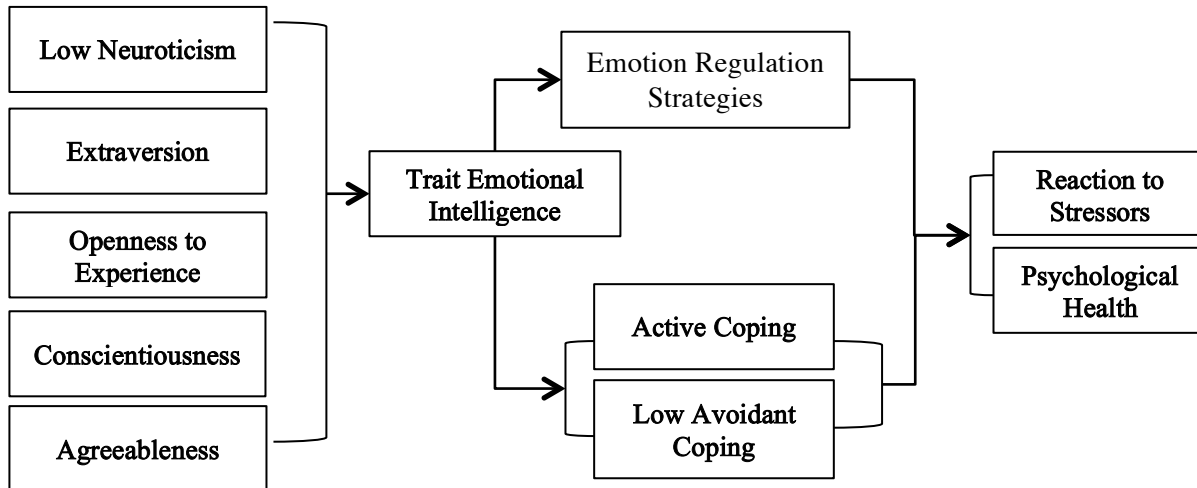


Figure 1. An integrative summary of the general aims of the thesis.³ All paths are positive in direction.

Specifically, this thesis aims to (1) understand whether, and to what extent, systematic differences exist among TEI measurement tools, and what the implications of those differences are for the nature of the TEI construct; (2) investigate whether coping styles and ER, particularly cognitive reappraisal, can explain the effect of TEI on psychological health and reactions to stress; (3) investigate whether types of reappraisal can be identified and classified according to a theoretically coherent framework; and (4) demonstrate whether types of reappraisal differentially moderate the effect of TEI on reactions to stress.

³ By depicting FFM as spatially preceding TEI, this is not to argue that FFM traits developmentally originate before TEI, as much more research is needed to understand and compare their developmental trajectories (see Magai & McFadden, 1995; Mavroveli, Petrides, Shove, & Whitehead, 2008). I argue that conceptually, this order is logical, for it has been demonstrated that TEI is situated at lower levels of the personality hierarchy (Petrides, Pita, et al., 2007). Additionally, given the proposition that coping and emotion regulation behaviours could explain the TEI – psychological health association, it is logical to organise the constructs in the way depicted in Figure 1.

This introduction has reviewed the relevant literature and introduced the thesis in the context of prior work in the field. Chapter 2 will present a meta-analysis of TEI and personality traits, in order to update previous efforts to quantify the degree to which TEI is subsumed by personality, and explore any systematic differences across TEI scales, addressing Aim 1. Chapter 3 will present a longitudinal study of how TEI explains changes in stress and anxiety throughout a stressful year, and investigate whether emotion regulation and coping styles can explain the effect of TEI on changes in distress, addressing Aim 2. Chapter 4 will present a cross-cultural cross-sectional study, which will explore whether coping and emotion regulation can explain the association between TEI and psychological distress, and see if the mechanisms vary between three distinct TEI scales. This will explore why TEI predicts general psychological distress (i.e., via coping and ER), and whether different TEI scales are tapping into different aspects of the TEI construct, addressing Aims 1 and 2. Chapter 5 will present a conceptual and empirical analysis of types of reappraisal, and present a framework for understanding how reappraisal is utilised, addressing Aim 3. Finally, Chapter 6 will assess whether distinct types of reappraisal are differently beneficial when faced with a discrete stressor, and see whether TEI will moderate the differential benefit of two types of reappraisal, addressing Aim 4. Together, this thesis explores the nature of TEI, the nature of reappraisal, and the effects of using reappraisal and adaptive coping for individuals with a high, versus low, TEI. It will bring together distinct areas of research in order to provide a more complete demonstration of how individuals can adaptively cope with stress, emphasising the importance of considering multiple factors in TEI research.

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Chapter 2: Meta-Analysis of TEI and Personality

The first empirical work of the thesis is presented in this chapter. It aims to explore the nature of the TEI construct in terms of how it is measured and the extent of its associations with personality traits. Specifically, this chapter quantifies the degree of association between TEI and traits in the five-factor model of personality (FFM), namely neuroticism, extraversion, agreeableness, openness to experience and conscientiousness, through a meta-analysis of existing data. As has been discussed in Chapter 1, there is a substantial degree of variation in the theoretical approaches to, and measurement of, TEI, which suggests that different scales are assessing different aspects of TEI. If this were true, I would predict that the scales would differently correlate with other personality traits. The extent of this variation, and where it exists, will help researchers better understand the construct of TEI by demonstrating how different theoretical perspectives to its measurement impact on degree of overlap with personality.

The work in this chapter is crucial for the rest of the thesis, as it informs the choice of TEI scale in the individual empirical works throughout the rest of the thesis. Furthermore, it demonstrates whether TEI is a unique and unified construct, in terms of its association with personality traits, which directly addresses the first aim of the thesis.

I was the major contributor to this co-authored paper. The concepts behind the study were mine, with input from Michael Jones. I collected the data and conducted the statistical analyses, with advice from Michael Jones. I drafted the first version of the manuscript, and both Michael Jones and Julie Fitness provided feedback and suggestions on multiple versions of the manuscript.

Please note, because this paper has developed over time, it is referenced in Chapter 4 as:

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Meta-Analysis of Trait Emotional Intelligence and Personality:
Heterogeneity in TEI Measurement

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Abstract

Trait emotional intelligence (TEI) has demonstrated consistent associations with the personality constructs that comprise the five-factor model (FFM). While previous work has consolidated the size of these associations using meta-analytic techniques, no work has quantified whether, and the degree to which, these associations might differ according to methodological factors. The current paper presents a meta-analysis of correlations between TEI and each of neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness, specifically investigating whether each set of correlations differs by (1) TEI measurement scale and (2) participant samples. Results presented quantify the degree of correlation between each TEI scale (and subscale) and each FFM trait, and demonstrate the existence of systematic and substantial variation in each TEI-FFM pooled correlation between TEI scales (especially for neuroticism, extraversion and conscientiousness), and to a lesser extent, participant samples. TEI scales based on broader socio-emotional dispositions (the TEIQue and EQ-i) showed stronger correlations with personality than other TEI scales, whereas narrower TEI measures (WLEIS and SUEIT) showed weaker correlations that were mostly uniform across FFM traits. There was comparatively less variation between studies due to differences between participant samples, although organisational employees and university students tended to show weaker correlations than community members. These results have significant implications for TEI, suggesting at best disunity, and at worst instability, in the construct.

Keywords: emotional intelligence; TEI; personality; FFM; meta-analysis; measurement

Meta-Analysis of Trait Emotional Intelligence and Personality: Heterogeneity in TEI Measurement

Since its emergence as a psychological construct, a great deal of research has been concerned with the extent to which trait emotional intelligence (TEI) is associated with existing psychological constructs, particularly personality (e.g. Dawda & Hart, 2000; Schutte et al., 1998; Tett, Fox, & Wang, 2005). The sometimes substantial size of these associations has led some researchers to question whether the construct of TEI offers anything unique over and above pre-existing personality measures (see Schulte, Ree, & Carretta, 2004; van der Zee & Wabeke, 2004). One reason this debate continues, though, is that reported correlations between TEI and personality vary quite substantially from study to study. A review of associations between TEI and personality factors is needed to update previous reviews (Joseph & Newman, 2010; van Rooy, Viswesvaran, & Pluta, 2005) to directly investigate why this variation in associations exists. Accordingly, the current study aimed to conduct a meta-analysis of the correlations between TEI and individual factors of the five-factor model of personality (FFM; neuroticism, N; extraversion, E; openness to experience, O; agreeableness, A; and conscientiousness, C), and formally examine why and to what extent correlations vary. Specifically, we aimed to determine whether systematic differences in correlations exist between (1) specific TEI measurement scales, and (2) populations from which participants have been sampled. The results of this study will help to further understand the unity of the TEI construct.

Trait Emotional Intelligence

TEI has been defined as individual dispositions and self-perceptions relating to emotional skills and positive emotionality, and is measured using self-report, typical-performance methodology (Petrides, Pérez-González, & Furnham, 2007). TEI is considered to be theoretically and methodologically distinct from ability emotional intelligence, which is

defined as “the capacity to reason about emotions, and of emotions to enhance thinking” (Mayer, Salovey, & Caruso, 2004, p. 197). Ability models consider emotional intelligence to be a tangible ability, like cognitive intelligence, that can be measured through maximum-performance tests. In contrast, TEI assesses individuals’ perceptions of how well they notice, understand and deal with emotional experiences, as well as other aspects of positive emotionality, and as such it is sometimes referred to as a personality construct in itself (e.g., Petrides, Pita, & Kokkinaki, 2007). Further, it is theoretically and empirically related to personality traits such as emotional stability (negative-loading N), social outgoingness (E), open mindedness (O), social cohesiveness (A), and attention to detail (C) (see, e.g., Brackett & Mayer, 2003; Caruso, Mayer, & Salovey, 2002; Davies, Stankov, & Roberts, 1998; Newsome, Day, & Catano, 2000).

Notably, some of the correlations between TEI and personality are quite strong (e.g. Newsome et al., 2000, report a correlation with N of $r = -.77$; Saklofske, Austin, & Minski, 2003, report a correlation with E of $r = .51$), leading some theorists to suggest that TEI may be nothing more than a combination of socially desirable personality factors (Matthews, Roberts, & Zeidner, 2004; Mayer, Salovey, & Caruso, 2008). Given the dubious utility of researching a younger construct that appears to be comprised of a subset of other, already well-validated, constructs (although, see Gignac, 2006, for an interesting discussion of the issue), there have been two attempts to formally investigate this claim. Firstly, van Rooy et al. (2005) conducted a meta-analytic review on the associations between both trait and ability emotional intelligence and various personality and cognitive constructs. More recently, Joseph and Newman (2010) presented an updated meta-analysis of both ability and trait models of emotional intelligence with FFM, cognitive ability and multiple job performance measures.

While both these reviews have consolidated the degree of association between emotional intelligence and personality, they have not systematically examined potential sources of variation within the trait model. Van Rooy et al. (2005) found adjusted correlations between TEI and the FFM ranging from .27 to .40. Joseph and Newman (2010) made a distinction between self-report ability scales (tools that are based on an ability definition of emotional intelligence, even though they utilise self-report methodologies) and self-report mixed emotional intelligence scales (self-report tools that are not explicitly based on the ability model but rather that include a broader consideration of dispositions). C and O adjusted correlations were identical between the two, but N, A and E varied substantially (up to .13 difference in correlations with each factor). Furthermore, there were still substantial degrees of variation in correlations within each of these two groups of measures. Given this, in this paper we aimed to look more closely at sources of variation, as is discussed in the following section.

Methodological Considerations

There are two potential sources of systematic variation in correlations that are the focus of the present study: differences in TEI measurement scales, and differences in populations from which participants have been sampled.

TEI scales. The first potential source of variation involves the proliferation of TEI measures used in empirical work. A large number of distinct measurement tools to assess TEI exist in the literature (see Stough, Saklofske & Parker, 2009, for a review). The greater the number of tools in use, the greater the potential for variation in what is being measured, and it is reasonable to question whether each tool is, in fact, measuring the same construct (Matthews et al., 2004; Petrides, Furnham, & Frederickson, 2004). This question is all the more important when examining the theoretical basis and development process of the tools. As the construct of TEI was developed after the ability model of emotional intelligence, the

conceptualisation and theoretical basis of most trait scales actually comprise self-report measures of the ability definition of EI. Six of these TEI measures were considered in the current study: specifically, the Self-Report Emotional Intelligence Scale (SREIS; Brackett, Rivers, Shiffman, Lerner, & Salovey, 2006); the Assessing Emotions Scale (AES; Schutte et al., 1998); the Trait Meta-Mood Scale (TMMS; Salovey, Mayer, Goldman, Turvey, & Palfai, 1995); the Wong and Law Emotional Intelligence Scale (WLEIS; Law, Wong, & Song, 2004); the Emotional Intelligence Questionnaire (EIQ; Vakola, Tsaousis, & Nikolaou, 2004) and the Swinburne University Emotional Intelligence Test (SUEIT; Palmer & Stough, 2001). All six of these TEI scales were developed based on the ability model of EI, though with slight differences in what specific factors are measured (which corresponds with whether the scale in question was based on the original Salovey & Mayer, 1990, model, or a more recent version, e.g., Mayer et al., 2004; Mayer & Salovey, 1997). Further, while based on the ability model, each of these scales use self-report methodology.⁴

Two other commonly used measures of TEI were developed specifically to measure trait, rather than ability, emotional intelligence: the Emotional Quotient Inventory (EQ-i) and Trait Emotional Intelligence Questionnaire (TEIQue). The EQ-i, developed by Bar-On (1997), is predominantly used in the literature as a measure of TEI, although Bar-On's theoretical model concerns socio-emotional competencies. The EQ-i was designed to measure "a cross-section of interrelated emotional and social competencies, skills and facilitators that determine how effectively we understand and express ourselves, understand others and relate with them, and cope with daily demands" (Bar-On, 2006, p.14).

⁴ As mentioned previously, Joseph and Newman (2010) separate self-report ability measures from self-report mixed measures of TEI. They note that the basis of this classification is the respective scale developers' explicit claims: "any EI measure purported to be based on an ability model was subsequently classified as an ability measure" (p. 64). However, of the scales reviewed in the current paper, only the AES and WLEIS were classified as self-report ability measures; it appears the other four scales discussed here as based on the ability model of emotional intelligence were not included in their analyses.

The TEIQue, while developed more recently than the EQ-i, was similarly designed to measure its authors' own, independent, construct of TEI, based on their review of the relevant literature and models of TEI, and is alternatively referred to as trait emotional self-efficacy, comprised of "personality facets that are specifically related to affect" (Petrides, Furnham, & Mavroveli, 2007, p. 274). This model was developed through assessment of the existing TEI measures and other personality constructs (Petrides & Furnham, 2001), and the researchers purposely defined the model that the scale was based on as distinct from the 4-factor model of ability emotional intelligence.

Given the differences in scale development among TEI measures, it is likely that each scale might associate differently with personality. For example, Petrides, Pita, et al. (2007) report a correlation of $r = -.68$ between the TEIQue and N, whereas Brackett and Mayer (2003) report a correlation of $r = -.19$ between the AES and N. C has been reported to correlate at $r = .06$ with the WLEIS (Cavazotte, Moreno, & Hickmann, 2012) and $r = .43$ with the EQ-i (Saklofske, Austin, Rohr, & Andrews, 2007). Furthermore, there is evidence for differences among TEI measures in correlations with other psychological constructs. Two reviews of the associations between emotional intelligence and various aspects of physical and mental health both demonstrated substantial differences in correlations between TEI and mental health, depending on the scale used (Martins, Ramalho, & Morin, 2010; Schutte, Malouff, Thorsteinsson, Bhullar, & Rooke, 2007). Other research has shown that both associations with coping and emotion regulation and psychological distress vary between the TEIQue, AES and WLEIS (Beath, Jones & Fitness, in press; Chapter 4). Thus, the first aim of the meta-analysis was to identify whether correlations between TEI and personality differed significantly between TEI measurement scales. Differences in correlations between TEI scales would suggest the measurement tools are measuring different constructs (or, at best, different aspects of the same construct).

Participant populations. The second methodological consideration concerns the populations from which participants have been sampled in the relevant works. Aside from the usual predominance of undergraduate university students used in psychological studies, a reasonable proportion of TEI research has been conducted within organisations (e.g. Kafetsios & Zarnpetakis, 2008; Rosete & Ciarrochi, 2005; Wong & Law, 2002), and some of the variation in correlations in the literature may be due to the variation in samples. For example, the correlation between the WLEIS and A was reported as $r = .18$ in a university sample (Ann & Yang, 2012), and $r = .40$ in an organisational sample (Kluemper, 2008). While researchers likely assume that correlations would be consistent between populations, differences like those reported above demonstrate the need for this to be formally investigated.

Therefore, the second aim of the meta-analysis was to examine whether systematic differences might exist in correlations between TEI and personality constructs across participant samples. It might be the case that some TEI scales were initially developed and validated with different populations than those populations they were subsequently used with. The discrepancy between populations could give rise to further variation in correlations between TEI and personality factors.

The Current Study

In summary, the current paper aimed to summarise existing empirical work on TEI and FFM by quantifying the average correlations between TEI and each of N, E, O, A and C. In doing so, we wished to identify and explore the source of systematic variation in associations. Specifically, we aimed to (1) determine whether systematic differences in correlations exist between TEI scales for each personality factor, and if so, to quantify the average correlation for each TEI scale (and subscale, if appropriate) with each FFM trait; and (2) determine whether systematic differences in correlations exist between participant

populations, and if so, quantify the average correlation for each participant sample and FFM trait. We hoped that the results of these analyses would shed light on the homogeneity or heterogeneity of the TEI construct and its relationship with other personality factors.

Method

Identification of Studies and Inclusion Criteria

The psychology database PsycInfo was searched for relevant studies, using a combination of the search terms ‘emotional intelligence’ and ‘personality’, from January 1990 to January 2013. The search was limited to peer-reviewed English language papers. Of the studies that were found, only those that included at least one of the traits of neuroticism, extraversion, openness to experience, agreeableness and conscientiousness (or their operational equivalents; e.g. emotional stability as negatively-loaded N; introversion as negatively-loaded E) as the personality measure were chosen. Studies also had to include an empirically validated measure of TEI: Any emotional intelligence scale that did not adopt a practical, task-based approach, but instead used self-report methodology, was considered a trait measure of emotional intelligence. Recursive searching was also conducted by identifying additional studies from reference lists of those already found, including papers included in the two previous meta-analyses (Joseph & Newman, 2010; van Rooy, Viswesvaran, et al., 2005) which reported the relevant statistics. Finally, leading researchers in the field were contacted regarding any unpublished work they might have that met the inclusion criteria. Two additional studies were obtained through this method. In total, 69 individual empirical studies that were identified from 59 published and unpublished works were included in the analyses, as some published works contained more than one study. See Figure 1 for a complete record of the number of studies excluded at each stage of the selection process.

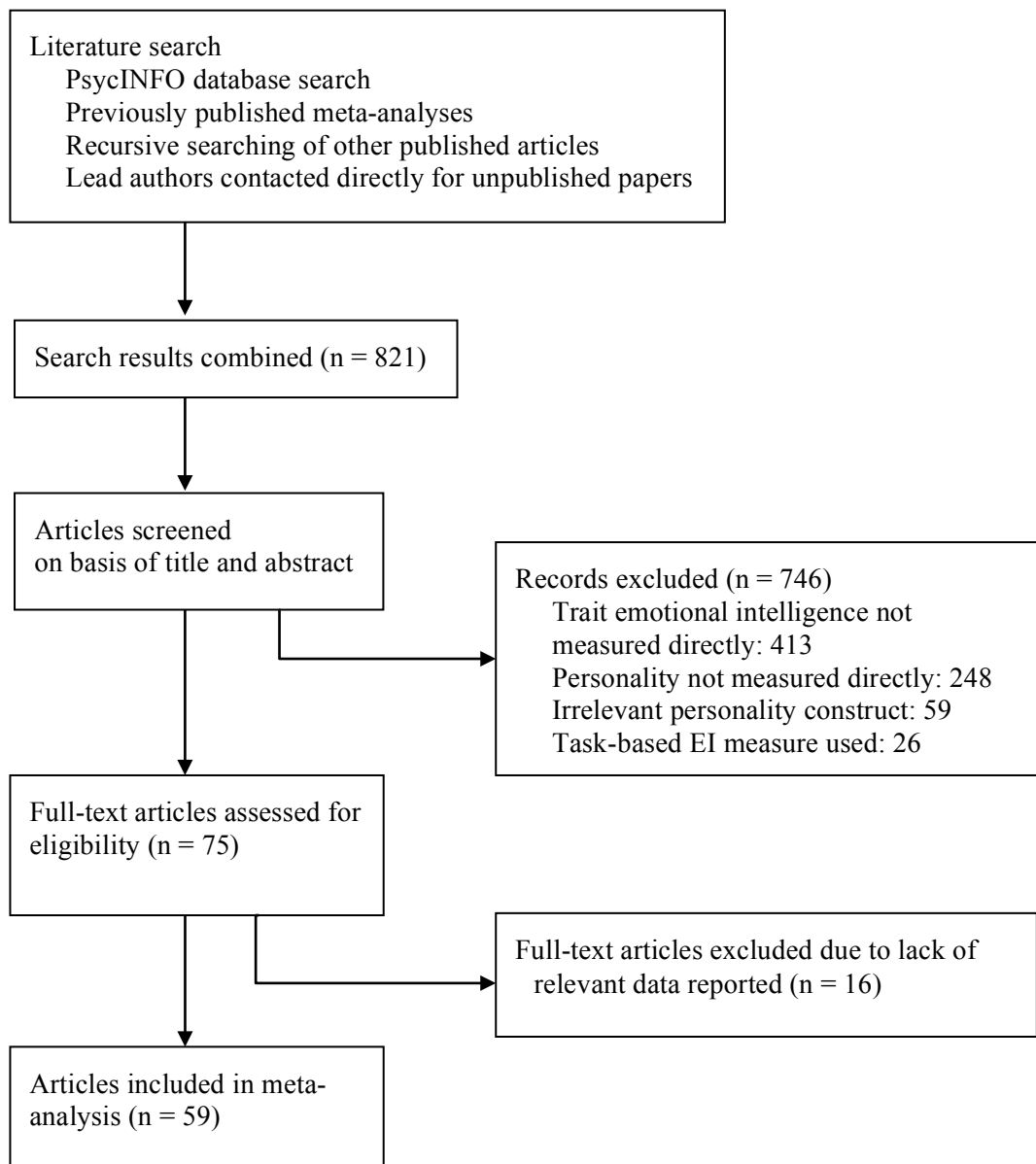


Figure 1. Flow diagram of study selection.

Data Extraction

The information that was extracted from each paper included the sample size and type of participant sample, TEI scale utilised, personality factors (and scales) utilised, and the relevant correlation coefficient. If any study reported having conducted correlational analyses with the relevant variables but did not publish the relevant correlation coefficients, the lead

author was contacted and the data were requested for inclusion. Both TEI total score and subscale correlations, where available, were included, in order to make estimates as precise as possible.⁵ However, both total score and subscale data from the same study were never included in the same analysis, as this would have included duplicated data.

Personality factors were classified into the five categories of the FFM according to the relevant personality theory. Only one personality trait subscale did not correlate with TEI in the expected direction, 16PF independence, which is theoretically analogous with low A (Conn & Rieke, 1994). Given this inconsistency, that particular factor was left out of all analyses.

Participant types were classified into 4 categories: university, community, university-community and organisation. University samples were comprised of university students (undergraduate, postgraduate or both); community comprised ordinary community samples; university-community samples were a combination of both university students and community members (where researchers reported analyses conducted on pooled samples); and organisation comprised organisational employees.

Meta-Analytic Procedures

Statistical analyses were conducted using Stata v. 13 (StataCorp, 2013). All analyses were based on the DerSimonian and Laird (1986) random effects model. Variances were adjusted using the linearization method (Kish, 1995). Given that there were multiple cases of multiple correlation coefficients being produced from the same study (for example, using different samples or multiple TEI scales, or multiple subscales within the TEI measure),

⁵ While the Trait Meta Mood Scale (TMMS) was developed to measure three separate facets (affect clarity, attention, and repair) and not be summed into a 'total' score (Salovey et al., 1995), a total score has been used in some studies (e.g., Warwick & Nettelbeck, 2004), and thus both total and subscale scores are included in the present analyses in order to best represent the use of the TMMS in the literature.

where possible, correlations were considered to be cluster-sampled according to each study's unique study ID.

Meta-regression analyses were performed to quantify the average correlation between TEI and each personality factor (N, E, O, A, and C), which provided a basis to assess variation according to the study's two aims. Five analyses (one for each FFM factor) produced pooled correlations, with the correlation coefficients as the dependent variable in the meta-regression. Any paper that published both subscale and total score correlations from the same TEI scale only had the total score included, which avoided including duplicated data from the same study. This produced a pooled correlation coefficient (as the intercept parameter from the regression model) and associated linearized standard error. Heterogeneity Q-statistics were produced (DerSimonian & Laird, 1986), to assess whether significant systematic variation existed within the correlations. Bias statistics using Egger's test (Egger, Smith, Schneider & Minder, 1997) assessed whether publication bias, the over-representation of positive or negative results, was evident in the data.

Aim 1. The first aim was to investigate differences between TEI scales for each personality factor. Five meta-regression analyses were conducted, one analysis per personality factor, with 7 of the 8 total TEI scales included as dummy-coded predictors, to produce an F-statistic that tested the statistical significance of the effect of TEI scale on the correlations. Significant results of these models indicated significant differences in correlations across TEI scales. Further meta-regressions were conducted using deviation coding, which assessed whether each total scale deviated significantly from the overall pooled correlation within each personality factor. We then selected the personality measurement scale that was the most highly represented in the data (NEO; Costa & McRae, 1992) and performed the same analyses on the correlations between each of the five NEO personality factors and TEI, in order to exclude any variation that was due to different

personality inventories. These analyses included both total scale and subscale data for each TEI scale, as sample sizes were too small to include only total scale data for each personality factor.

Then, for each total scale, individual meta-regressions were conducted to produce the overall pooled estimate for each combination of TEI scale and personality factor. These regressions also produced heterogeneity Q-statistics and publication bias coefficients to assess systematic unexplained variance and the possibility of publication bias.

Next, analyses were conducted to assess differences in correlations across subscales within each TEI scale. These analyses only included subscale data, not total scores. For those trait scales that comprised of subscales, meta-regressions were performed within each scale to assess, first, the overall pooled estimate of each subscale within each personality factor. Second, deviation coding was used to see which subscales deviated significantly from the pooled correlation for that scale. Third, individual regressions were performed to produce a pooled estimate for each subscale with each personality factor. These regressions also produced heterogeneity Q-statistics and bias coefficients, to assess systematic unexplained variance and publication bias.

Aim 2. The second aim of the meta-analysis was to determine whether systematic differences in correlations exist between participant populations. For these analyses, any paper that published both subscale and total score data from the same TEI scale only had the total score included, to avoid including duplicated data. Initially, five meta-regression analyses were performed, one per personality factor, with three of the four participant types included as dummy variables, to produce an F-statistic that tested the significance of the effect of sample on the correlations. Significant results of these models indicated significant differences in correlations across participant types. Further meta-regressions were conducted using deviation coding to assess whether each sample type deviated significantly from the

overall pooled correlation within each personality factor. Then, for each sample type, individual meta-regressions were conducted to produce the overall pooled correlation for each sample and personality factor. These regressions also produced heterogeneity Q-statistics and bias coefficients, to assess systematic unexplained variance and publication bias, for each sample within each personality factor.

Results

Descriptive Statistics

Descriptive information of studies used in the meta-analyses can be seen in Appendix A Table 1, including citation details of the papers, sample sizes, TEI scale used, whether total scores or factor subscales were reported, FFM factor used, which personality inventory the factor was taken from, and the participant sample utilised.

Studies included 33 individual measures from eight total TEI scales. The five personality traits were sampled from 14 different personality inventories.

Overall Results

Overall pooled correlations between each personality factor and TEI respectively are summarised in Table 1.

Table 1

TEI pooled correlations with each FFM factor

FFM factor	<i>k</i>	Pooled estimate		Heterogeneity <i>p</i>	Bias <i>p</i>
		<i>r</i>	95% CI		
N	132	-.376	[-.438, -.312]	<.001	.620
E	132	.318	[.273, .363]	<.001	.019
C	115	.295	[.263, .327]	<.001	.262
O	115	.183	[.145, .220]	<.001	.481
A	115	.262	[.215, .309]	<.001	.630

Note. *k* = number of included correlations. *r* = pooled correlation.

The strongest association for TEI was with N, followed by E, C, A and O. The range in correlations was not large, with all five associations within .20 points.

Heterogeneity tests and publication bias analyses are also displayed in Table 1.

Publication bias tests were significant only for E, which indicates that there is no evidence of publication bias for the other four factors. Heterogeneity statistics, however, were significant for all factors, indicating systematic variance in each of the correlations currently unaccounted for. The significance of these heterogeneity tests makes it appropriate to conduct further analyses.

Aim 1: TEI scale variation

Analyses were conducted to assess the variation in correlations across TEI measures; firstly, at the level of total scales, then at the individual subscale level within each TEI scale.

Total TEI scales. The assessment of differences in correlations across different TEI scales was performed via meta-regression and occurred in two stages. Firstly, for each personality factor, meta-regressions were performed to assess whether there were any statistically significant differences between the eight total TEI scales (see Table 2). Secondly, more specific analyses using deviation coding identified the extent that the correlation for each TEI scale differed from the average pooled correlation for each personality factor.

Table 2

Overall F test and significance values of total scale type on correlations for total TEI scales

FFM factor	<i>df</i>	<i>F</i>	<i>p</i>	R-sq (%)
N	7, 70	18.51	<.001	64.9
E	7, 70	17.27	<.001	63.3
C	7, 67	9.92	<.001	50.9
O	7, 66	2.93	.010	23.7
A	7, 67	2.80	.013	22.6

Table 2 displays the results of the five meta-regressions, one for each personality factor, with the eight total scale scores as predictors in each. This assessed whether the correlations were significantly different across the scales. Analyses were weighted, but it was not possible to adjust standard errors for cluster sampling from studies due to the vast

majority of studies yielding a single result. However, the overall correlation for each personality factor reported in Table 3 was obtained from separate analyses that were clustered by study ID.

For all five personality factors, the overall F-test was significant, which showed a significant difference in the average correlations between TEI and each of N, E, C, O and A across TEI scales. TEI scale explained slightly less than a quarter of the variation in correlations for O and A, and between 50-65% of variation in correlations for N, E and C, which is substantial.

Next, we ran analyses using data from a single personality factor model, the NEO, to reduce variability due to pooling multiple different personality models together.

Table 3

Overall F-test and significance of scale type on NEO correlations for total TEI scales

FFM factor	<i>df</i>	<i>F</i>	<i>p</i>	R-sq (%)
N	6, 42	3.04	.015	30.3
E	6, 43	4.15	.002	36.7
C	6, 36	4.28	.002	41.6
O	6, 36	2.37	.049	28.3
A	6, 37	3.41	.009	35.6

As can be seen in Table 3, significant differences are still present in the correlations between each FFM factor and total TEI scales. Differences between TEI scales explained between 28 and 42% of the variation in correlations.

Deviation coding was utilised in order to assess whether each total scale deviated significantly from the overall average correlation for each factor (see Table 4). Further, individual meta-regressions were produced for each personality factor on a subset of this total scale data, assessing each total scale individually, to allow for the production of a pooled estimate for each scale. Analyses were weighted, but not clustered by ID, as most studies only produced a single result within each combination.

Table 4

Pooled estimates and deviations for total TEI scales

	Scale	<i>k</i>	Pooled estimate		Heterogeneity <i>p</i>	Bias <i>p</i>
			<i>r</i>	95% CI		
N						
	TEIQue ^a	17	-.560**	[-.629, -.490]	<.001	.195
	EQ-i ^a	14	-.548**	[-.618, -.478]	.001	.274
	SREIS ^b	1	-.210	[-.321, -.099]		
	AES	14	-.305*	[-.390, -.220]	<.001	.766
	TMMS ^a	3	-.336	[-.536, -.135]	.558	.265
	WLEIS ^a	7	-.407	[-.588, -.225]	<.001	.667
	EIQ ^b	1	-.658*	[-.827, -.489]		
	SUEIT ^a	21	-.129**	[-.185, -.071]	<.001	.520
	<i>Mean</i>	78	-.392	[-.448, -.336]		
E						
	TEIQue ^a	17	.475**	[.412, .539]	<.001	.106
	EQ-i ^a	14	.383	[.333, .432]	.158	.731
	SREIS ^b	1	.430	[.261, .599]		
	AES	13	.347	[.278, .416]	.001	.959
	TMMS ^a	3	.297	[-.016, .610]	.860	.827
	WLEIS ^a	8	.200**	[.042, .360]	<.001	.010
	EIQ ^b	1	.539	[.370, .708]		
	SUEIT ^a	21	.059**	[.001, .117]	<.001	.266
	<i>Mean</i>	78	.290	[.244, .335]		
C						
	TEIQue ^a	15	.371	[.299, .444]	<.001	.049
	EQ-i ^a	15	.350	[.291, .408]	.018	.902
	SREIS ^b	1	.190	[.021, .359]		
	AES	13	.267	[.203, .330]	.013	.378
	TMMS ^a	3	.274	[.032, .515]	.421	.369
	WLEIS ^a	6	.321	[.122, .519]	<.001	.785
	EIQ ^b	1	.601**	[.432, .770]		
	SUEIT ^a	21	.086**	[.041, .131]	.017	.101
	<i>Mean</i>	75	.307	[.257, .357]		
O						
	TEIQue ^a	16	.290	[.247, .333]	.087	.708
	EQ-i ^a	14	.184	[.103, .265]	<.001	.112
	SREIS ^b	1	.410	[.241, .579]		
	AES	13	.262	[.192, .331]	.005	.655
	TMMS ^a	3	.310	[-.306, .926]	.001	.504
	WLEIS ^a	6	.142*	[.045, .239]	<.001	.075
	EIQ ^b	1	.201	[.032, .370]		
	SUEIT ^a	20	.147**	[.081, .214]	<.001	.510
	<i>Mean</i>	72	.244	[.191, .296]		
A						
	TEIQue ^a	15	.299	[.226, .372]	<.001	.007
	EQ-i ^a	14	.369*	[.278, .461]	<.001	.400
	SREIS ^b	1	.040*	[-.129, .209]		

Scale	<i>k</i>	Pooled estimate		Heterogeneity <i>p</i>	Bias <i>p</i>
		<i>r</i>	95% CI		
AES	12	.307	[.182, .432]	<.001	.916
TMMS ^a	3	.323	[.138, .507]	.544	.950
WLEIS ^a	7	.254	[.166, .343]	.057	.383
EIQ ^b	1	.389	[.220, .558]		
SUEIT ^a	21	.188*	[.139, .238]	.002	.021
<i>Mean</i>	73	.273	[.217, .329]		

Note. Pooled estimated are flagged for significance if they deviate from the overall correlation for the respective personality factor. * $p \leq 0.05$ ** $p \leq 0.01$ ^a total TEI scale only (subscales not included). ^b Meta-regressions could not be performed, as these two scales only had one observation per personality factor; pooled estimates and confidence intervals reported are taken from the single observation. *k* = number of included correlations. *r* = pooled correlation.

Table 4 displays data for each total TEI scale within each personality factor. The pooled estimate is the average correlation between each scale and personality factor, and the deviation displays the extent of the difference between the correlation for each scale and the overall TEI correlation for each personality factor.

N showed the greatest number of deviations, with five of the eight TEI scales deviating significantly from the overall pooled correlation. The TEIQue, EQ-i and EIQ had stronger (more negative) correlations, and the AES and SUEIT had smaller (less negative) correlations. Three significant deviations were found for both of E (TEIQue, stronger; WLEIS, weaker; and SUEIT, weaker) and A (EQ-i stronger; SREIS, weaker; and SUEIT, weaker). Two significant deviations were found for both of C (EIQ, stronger; SUEIT, weaker) and O (WLEIS, weaker; SUEIT, weaker).

Looking at the overall pattern of correlations, the TEIQue was the only scale with a consistent pattern of correlations for all five factors: It displayed uniformly stronger correlations with each personality factor compared to the overall average, and significantly

stronger correlations for two factors, N and E. The EQ-i had stronger correlations for four of the factors (all except O). The WLEIS showed weaker correlations overall for four of the factors (all except C), as did the SUEIT (all except O, where it was significantly stronger). The other three scales (AES, SREIS and EIQ) exhibited inconsistent patterns of significance. The TMMS was the only scale that did not deviate significantly from the average correlation for any factor.

Most heterogeneity statistics were significant for these analyses, particularly among the TEIQue, AES, WLEIS and SUEIT, indicating systematic patterns of variance still unaccounted for within these sets of correlations. Finally, most bias statistics were not significant, demonstrating no convincing evidence of publication bias.

TEI subscales. The next analyses assessed differences between subscales of each TEI scale for each personality factor. Table 5 shows the effect of subscales within each overall scale for the TEIQue, EQ-i, TMMS, WLEIS and SUEIT. (The EIQ had only one observation per personality factor, which did not allow for meta-regression analyses to be run.)

Table 5

Differences in correlations between TEI subscales for each TEI scale and personality factor

Scale	<i>df</i>	<i>F</i>	<i>p</i>	R-sq (%)
TEIQue				
N	3, 8	4.27	.045	61.6
E	3, 8	3.70	.062	58.1
C	3, 8	1.80	.224	40.4
O	3, 8	11.03	.003	80.5
A	3, 8	5.90	.020	68.9
EQ-i				
N	4, 13	18.55	<.001	28.7
E	4, 13	23.18	<.001	58.2
C	4, 12	15.19	<.001	14.0
O	4, 12	15.34	<.001	23.9
A	4, 12	4.70	.016	37.9
TMMS				
N	2, 18	23.99	<.001	72.7
E	2, 24	3.92	.034	24.6
C	2, 15	6.20	.011	45.4
O	2, 15	0.12	.886	1.6
A	2, 15	1.14	.347	13.2
WLEIS				
N	3, 12	0.50	.689	11.1
E	3, 12	1.38	.298	25.6
C	3, 12	2.36	.123	37.1
O	3, 12	1.38	.289	25.6
A	3, 12	0.50	.689	11.1
SUEIT				
N	4, 5	7.77	.022	86.2
E	4, 5	2.99	.130	70.5
C	4, 5	2.57	.164	67.3
O	4, 5	0.56	.703	30.9
A	4, 5	0.11	.974	8.2

Note. Standard errors have been clustered for TEIQue and TMMS results. The data on the other three scales did not include enough multiple results per study to allow for clustering.

For four of the five TEI scales, the effect of subscale was significant for N. EQ-i subscales differed significantly in correlations with all five personality factors. TEIQue subscales differed significantly for N, O, and A (and marginally significant for E). TMMS

differed significantly for three factors (N, E, and O); SUEIT subscales differed only for N; and WLEIS subscales did not differ for any personality factor. However, while the EQ-i showed the most consistent differences, EQ-i subscales did not explain as much variance in the total correlations as some other scales, with between 14% and 58% of the variation explained by EQ-i subscales, compared with over 80% for the TEIQue and SUEIT and some personality factors.

Subscale-level pooled estimates and deviation coefficients can be seen in Appendix A Table 2. All five TEI scales had significant deviations among subscales for at least one personality factor. WLEIS subscales differed the least (only one subscale differed for one factor, C). EQ-i subscales varied the most, at least two subscales for each of the five factors. These correlations consolidate the average correlations for each TEI subscale.

Heterogeneity and bias. Heterogeneity and bias analyses were also conducted within each total scale (where there were 2 or more observations), and subscale, for each personality factor. Most heterogeneity tests were significant, indicating that even controlling for variation across TEI scales, and across subscales of the same scale, there is still systematic unexplained variance. Some of this variation would be due to differences in participant populations, as these were not controlled for in TEI scale analyses, as cell sizes would have been too small. Further, the significance of the some tests should be interpreted cautiously, as they can be unreliable in small sample sizes (Egger et al., 1997). Four of the 30 bias statistics were significant on the total scale level, and eight of the 80 at the subscale level, most commonly for the WLEIS and EQ-i.

Aim 2: Participant sample variation

The second methodological consideration was the type of participant sample utilised in each study. Five meta-regressions were performed, one for each personality factor, using sample type to predict correlation coefficients. F-tests were conducted to determine whether

correlations for each personality factor differed significantly between sample types. Overall results can be seen in Table 6 below.

Table 6

Overall F test and significance results of participant sample types

FFM factor	<i>df</i>	<i>F</i>	<i>p</i>	R-sq (%)
N	3, 128	1.40	.246	3.2
E	3, 128	1.57	.201	3.5
C	3, 111	0.30	.824	0.8
O	3, 111	2.00	.118	5.1
A	3, 111	3.33	.022	8.3

The effect of participant sample on the pooled estimates was significant for only one of the five personality factors, A, explaining around 8% of the variance in correlations, which is substantially less than the variation due to TEI scale. This illustrates that the associations between TEI and A do significantly differ across participant samples, though the size of these differences is fairly small.

Deviation coding allowed us to assess which sample types differed significantly from the overall pooled estimate for each personality factor. Individual significances have been flagged for all deviations that differ significantly from the overall pooled estimate ($p < .05$), regardless of whether the factor has an overall effect of participant type (in Table 6 above). Results can be seen in Table 7 below.

Table 7

Pooled estimates and deviations for participant sample types

Sample	<i>k</i>	Pooled estimate		Heterogeneity <i>p</i>	Bias <i>p</i>
		<i>r</i>	95% CI		
N					
Univ	96	-.386	[-.435, -.336]	<.001	.915
Comm ^a	3	-.503	[-.721, -.285]	.740	.715
UC	8	-.470	[-.560, -.381]	.011	.710
Org	25	-.298	[-.521, -.074]	<.001	.030
E					
Univ	96	.325	[.287, .364]	<.001	.036
Comm ^a	3	.415	[.329, .501]	.678	.358
UC	8	.386	[.307, .466]	.168	.356
Org	25	.257*	[.144, .369]	<.001	.022
C					
Univ	86	.288	[.260, .317]	<.001	.072
Comm ^a	3	.311	[.194, .429]	.477	.448
UC	7	.329	[.262, .392]	.005	.023
Org	19	.312	[.196, .428]	<.001	.738
O					
Univ	85	.175*	[.142, .207]	<.001	.363
Comm ^a	2	.380	[-.452, 1.212]	.172	
UC	9	.239	[.169, .308]	.237	.968
Org	19	.172	[.095, .248]	.201	.639
A					
Univ	86	.257	[.220, .294]	<.001	.677
Comm ^a	2	.400	[-1.537, 2.337]	.002	
UC	8	.425	[.299, .551]	.005	.314
Org	19	.207*	[.048, .366]	<.001	.922

Note. univ = university sample; comm = community sample; UC = university and community sample combined; org = organisational sample. *k* = number of included correlations. *r* = pooled correlation. Correlations are flagged for significance if they deviate from the overall correlation for the respective personality factor. **p* < .05. 95% CI = 95% confidence interval.

^a bias tests could not be performed on community samples due to small cell sizes.

Organisational employees differ the most from the overall estimate, displaying significantly smaller correlations for E and A, and non-significantly smaller correlations for N, C, and O as well. University students show significantly smaller correlations for O, and

overall show smaller (though non-significant) correlations for the other 4 factors as well. The other two participant types, community and university-community, show no significant deviations from the overall estimate, though display slightly larger correlations overall for most factors.

Again, heterogeneity tests and bias analyses were conducted. Similar to the scale analyses, the results of the heterogeneity analyses indicated further degrees of systematic variation than are accounted for here, with some significant results for all 5 factors, particularly for the university samples, which is unsurprising given those samples include the majority of the data. This is likely due to the substantial variation in TEI scales previously discussed (but not controlled for in these particular analyses, as cell sizes would have been too small to conduct analyses). Bias analyses indicated some potential for publication bias (organisational employees for N and E, and university for E), though given the small number and unsystematic nature of the significant results, there is no strong evidence of publication bias.

Discussion

This meta-analysis set out to investigate the degree of association between TEI and each personality factor of the FFM, and specifically explore whether, and to what degree, systematic variation was present due to differences between (1) TEI scales and (2) participant samples. Results showed that, primarily, substantial differences exist between TEI scales for all five FFM factors, and to a lesser extent, differences exist between participant samples, most consistently for A.

The overall pooled correlations between TEI and the personality factors, from weakest to strongest, were $r_s = .183$ (openness to experience), $.262$ (agreeableness), $.295$ (conscientiousness), $.318$ (extraversion) and $-.376$ (neuroticism). These pooled correlations were slightly weaker than those reported in previous meta-analyses (Joseph & Newman,

2010), which is likely due to differences among which scales were included (as noted in the Introduction, of the eight TEI scales included in the present analyses, data from only two were included in Joseph & Newman's study) and slightly different adjustment methods in the data analysis itself.⁶ The unique contribution of the current study, though, is that while the overall pooled correlations are moderate at best, there was a substantial degree of variation around each of these average correlations, which was due primarily to differences between TEI scales, and secondarily to differences between participant populations.

TEI Scales

For all five personality factors, correlations were found to differ significantly across individual TEI scales. Differences between TEI scales explained between 20 and 65% of the variation in correlations, with the greatest amount of variation explained for E, N and C. Furthermore, seven of the eight trait scales, all except the TMMS, differed significantly from the overall mean correlation on at least one personality factor at the total scale level. When identifying individual correlations for each subscale, all scales showed significant deviation, some to substantial degrees, from the overall pooled correlations, within each personality factor.

While many individual results were presented, some trends emerged. Overall, the TEIQue and EQ-i displayed stronger correlations with personality factors than the average TEI scale. The WLEIS and SUEIT tended to have weaker correlations. The SREIS and EIQ displayed slight, inconsistent, deviations, and given their small number of observations, more

⁶ For example, Joseph and Newman (2010) made several corrections that were appropriate to their particular analyses, given their use of mixed method data (Oswald & Converse, 2005). However, because the present analyses did not include mixed method data, these corrections were not appropriate. Additionally, Joseph and Newman note that if any study reported more than one effect size per scale (e.g. subscale-level correlations), the authors computed a composite measure themselves and included this composite. Our study instead included all the original data and statistically adjusted for non-independence due to multiple effect size measures per study (via the linearization method).

data is needed to draw any real conclusions. The AES and TMMS had similar correlations to the average estimate for each personality factor.

Substantial differences exist in the theoretical basis upon which the scales were based. While all eight scales are classified as TEI measures, as was discussed earlier, theoretical differences in their construction lead to distinctions among them. Six of these scales (the SREIS, AES, TMMS, WLEIS, EIQ and SUEIT) were developed similarly, using self-report methodology to assess Mayer and colleagues' (2004) four-branch theoretical model of emotional intelligence. The EQ-i and TEIQue are distinct, though, as rather than being modelled on Mayer et al.'s theory, were designed to assess socio-emotional competencies and emotional self-efficacy of Bar-On (2006) and Petrides and Furnham (2001) respectively.

This theoretical distinction is confirmed by the results of the current study, as overall the TEIQue and EQ-i displayed stronger correlations than the other scales with the personality factors. The most consistent pattern at the scale level was that across all five personality factors for the TEIQue, and four of the five factors for the EQ-i, these scales exhibited stronger associations than the average trait correlation, with two factors significantly stronger for each of the scales (N and E for the TEIQue, N and A for the EQ-i). This reflects the stronger personality-focused theoretical background of these two scales, compared to the TEI model on which the other 6 scales are based, confirmed with empirical data.

It is also interesting that even though the EQ-i and TEIQue were developed independently to measure separate theoretical constructs, their patterns of correlations were very similar. Across the five FFM factors at the total TEI scale level, for only one personality factor (O) did the average correlations differ by more than 0.1, and that was only slightly ($r = .184$ for the EQ-i and $r = .290$ for the TEIQue), indicating that in terms of their associations with personality, the two scales are very similar.

The other most consistent pattern to emerge from the results is that the WLEIS and SUEIT both displayed, on average, smaller correlations with the personality factors than the other scales. This may be due to both these scales being heavily used in organisational contexts (e.g., Downey, Lee, & Stough, 2011; Wong & Law, 2002). In fact, the results of the participant population analyses demonstrated that studies using organisational samples show weaker correlations than the other samples for all five factors (and significantly weaker for N, E and A), which is consistent with the WLEIS and SUEIT having smaller effects overall. However, the EIQ was also developed for use in organisational settings, and it did not display the same pattern of results (in fact, exhibited significantly stronger correlations than the average for two factors, N and C), suggesting the WLEIS and SUEIT, perhaps due to their respective scale development processes, might be measuring slightly different constructs than the others. It is also interesting that despite their differences in development process and differences in sub-scales, their patterns of correlations are so similar.

The existence of statistically significant deviations across all TEI scales, either at the total scale or subscale level, indicates that substantial, systematic variation exists in the measurement of TEI. While variation at the subscale level is acceptable, even desired, as subscales are developed in order to tap into slightly different aspects of the same construct, variation between total scale scores is undesirable. While these results will likely not be surprising for some TEI researchers, who have commented on the issue (e.g., Pérez, Petrides & Furnham, 2005; Schutte, Malouff & Bhullar, 2009), it is still important for the literature because the scales are used interchangeably to measure TEI. The literature assumes a singular TEI construct, which implies that unintentional differences exist in the underlying construct being measured by different TEI instruments. (In fact, it has only been relatively recently that the important distinction between ability and trait emotional intelligence has become widely accepted; see, e.g., Mayer et al., 2008.) A construct is, practically speaking, only as useful as

the measurement tools used to assess it, and the results of these analyses have shown that there is substantial variation in the tools used to measure TEI, at least as demonstrated by associations with personality factors. Given the difference in results between, on the one hand, the EQ-i and TEIQue, and on the other hand, the other six scales, it seems that there might be two distinct TEI constructs being measured by these scales – socio-emotional dispositions, which is more personality-oriented, and self-reported emotional skills, which is less personality oriented.

Participant Populations

The second methodological consideration in this study was to investigate whether there was significant variation according to the population from which participants had been sampled. The results suggested small differences in the degree of association between TEI and personality measures across different population samples. Only one factor, A, was found to have significant variation according to participant type. Looking at the individual deviations, studies using organisational employees showed weaker associations with personality factors, particularly N, E and A. There was some evidence that university samples also demonstrated weaker correlations with personality factors than the other sample types, though this was less convincing than organisational employees. The other two sample types, community members and combination university students and community members, showed slightly stronger correlations, though were not significant for any personality factor. The non-significance of results is unsurprising for the pooled university and community group. University populations displayed slightly weaker correlations than the average, and community populations displayed slightly stronger correlations than the average; by pooling the two samples, the effects would be cancelled out. In future, researchers should ensure that they keep these two groups distinct, given these results.

While these results show that while there is some evidence for different associations with personality in different populations, we are unsure as to the reason behind these differences. Future research should investigate this more thoroughly, bearing in mind that systematic variation across participant populations will likely reflect on the instability of TEI. It is important to bear in mind, though, that the extent of the difference in associations across participant samples was found to be much smaller than the difference across TEI scales.

Heterogeneity and Bias

Bias analyses were conducted to assess for publication bias, and only a small proportion of these tests were significant, which suggests there is no clear evidence of publication bias in these data. However, when looking at the associations within each factor and within each scale and participant type, there was still systematic unexplained variance in most instances, as demonstrated by the significant heterogeneity tests. This is likely due to multiple factors. Firstly, personality scales from different factor inventories (e.g., NEO, 16PF, IPIP, etc.) were grouped together under the five FFM factors for most of these analyses, and analyses were not conducted to determine whether systematic variation existed within each of the personality factors as this was not the focus of the present study. While it is to be expected that differences in correlations would be seen between personality inventories, further analyses were conducted to investigate whether there were significant differences among TEI total scales within only one personality model, the NEO, and results of these analyses confirmed the significant differences in correlations between TEI measurement scales.

Secondly, while we found that there were significant differences in the size of associations between TEI and the personality factors according to TEI scale, and to a lesser extent participant sample, each of these sets of analyses did not control for the variation attributed to the other. This was due to the large number of variables that would have needed

to be controlled, which was not feasible given the small sample sizes involved. However, each of these sources of variation would be contributing to the unexplained variance in the other analyses, and likely explains the significance of the heterogeneity tests.

Conclusions and Implications

While the extent of correlation between TEI and FFM factors is fairly well known for many TEI researchers, and most do control for this shared variance (Mikolajczak, Roy, Luminet, Fillée, & de Timary, 2007; Saklofske, Austin, Mastoras, Beaton, & Osborne, 2012), particularly in areas where FFM factors are known to be predictive, such as psychological well-being (DeNeve & Cooper, 1998; Smith & Williams, 1992), the finding that associations between each personality factor and TEI varied based on methodological factors that, ideally, should not make an impact is a crucial contribution to TEI research. Correlations between TEI and personality differed significantly according to which TEI scale was used, and, to a lesser extent, which participant sample the research study used. This indicates that a unitary construct of TEI is not being consistently measured in empirical research. Furthermore, it is argued that there likely exist two somewhat distinct models within the TEI field: a broader model of socio-emotional dispositions (measured by the TEIQue and EQ-i), and more narrow self-assessment of emotional skills, measured by the SREIS, AES, TMMS, WLEIS, EIQ and SUEIT. We would argue that this variation according to the trait measure used warrants consideration in future research. Researchers need to be aware of these discrepancies, and to actively select the TEI scale most appropriate for research projects based on that scale's prior associations with constructs of interest, as well as the theoretical model most appropriate to the research question. Further understanding of the source of, and reasons for, these differences is needed if the field of trait emotional intelligence is to continue to grow.

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Chapter 3. TEI and Longitudinal Changes in Psychological Distress:

The Roles of Reappraisal and Coping

The previous chapter focused on the construct of TEI, and the results of the study reported there showed that TEI is a unique but not unified construct. The present chapter represents the first attempt in this thesis to show the utility of TEI in predicting how individuals react to a stressor.

This thesis is focused on understanding whether, and why, TEI is a useful construct in explaining individual differences in psychological health. Previous work has shown that TEI can explain individuals' distress in the context of experimental stressors (Mikolajczak, Luminet, & Menil, 2006; Mikolajczak, Petrides, Coumans, & Luminet, 2009) and real-world stressors over time (Austin, Saklofske, & Mastoras, 2010; Saklofske, Austin, Mastoras, Beaton, & Osborne, 2012). However, the present study is the first of its kind to explore how individuals' stress and anxiety can change over time in the context of a high-stress year, and to quantify how TEI can predict this change. Further, and importantly, this study directly investigates whether the association between TEI and distress can be explained by the use of coping styles and emotion regulation, which to date research has not investigated. By measuring how multiple measures of distress change over an especially high-pressure academic year, the study was able to investigate the mechanisms involved in the difference in how high versus low TEI students changed over time, while maximising external validity.

In the context of this thesis, this chapter is the first to examine how coping and emotion regulation relate to TEI. In Chapter 1, I proposed that coping and emotion regulation, particularly reappraisal, might explain how TEI predicts individual differences in dealing with stress. As the rest of the thesis explores different aspects of these relationships, this chapter is the first attempt to do so, and thus is crucial to setting up the importance of these potential explanatory factors. In doing so, this chapter addresses the second aim of the thesis.

I was the major contributor to this co-authored paper. The study concepts were mine, with input from Michael Jones. I collected the data and conducted the analyses, with

assistance from Michael Jones. I drafted the first version of the manuscript, and both Michael Jones and Julie Fitness provided feedback and suggestions on multiple versions of the manuscript.

Please note, because this paper has developed over time, in Chapter 4 it is referenced as:

Beath, A. P., Jones, M. P., & Fitness, J. (2014). *Trait emotional intelligence and longitudinal changes in psychological distress: A mechanistic explanation.*

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Trait Emotional Intelligence and Longitudinal Changes in Psychological Distress:
A Mechanistic Explanation

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Abstract

Trait emotional intelligence (TEI) predicts lower stress and anxiety, and greater satisfaction with life (SWL), during stressful experiences. The first aim of this study was to examine the extent to which TEI might predict longitudinal changes in psychological distress in the context of a stressful event. The second aim was to determine whether mechanisms of coping styles (active and avoidant coping) and emotion regulation strategies (rumination, reappraisal and suppression) might explain the effects of TEI on stress, anxiety and SWL, controlling for five factor model of personality traits. In a longitudinal study, $N = 83$ students completed measures at the beginning, middle and end of a high-pressure academic year. Compared to low TEI, high TEI individuals reported a smaller increase in anxiety, but a larger increase in stress. These effects were fully explained by cognitive reappraisal (stress) and partially explained by active coping (stress) and avoidant coping (anxiety). No change in SWL was seen throughout the year. The mechanisms are discussed in the context of situation-specific coping: High TEI individuals used more reappraisal and active coping, which elevated their stress levels, but which also helped them to deal with task demands, keeping anxiety low.

Keywords: trait emotional intelligence; coping; reappraisal; stress; anxiety

Trait Emotional Intelligence and Longitudinal Changes in Psychological Distress:

A Mechanistic Explanation

Research into trait emotional intelligence (TEI) has demonstrated reliable associations with various measures of psychological distress and well-being (e.g., Ciarrochi, Dean, & Anderson, 2002; Gannon & Ranzijn, 2005): Individuals with higher dispositional TEI generally experience less stress and anxiety, and greater well-being. While recent longitudinal (Austin, Saklofske, & Mastoras, 2010) and experimental (Mikolajczak, Petrides, Coumans, & Luminet, 2009) research on the impact of TEI in the context of a stressful event furthers our understanding beyond earlier correlational work, it has yet to be investigated whether TEI can predict *change* in psychological distress, over a period of time. Further, if TEI does predict changes in distress, we would like to understand why: What specific strategies explain this association? The overall aim of the current study was to explore the relationship between TEI and changes in psychological distress throughout a stressful event over time, and to investigate whether the mechanism underpinning this relationship might be a function of emotion regulation strategies and coping styles.

TEI and Psychological Distress

The popularity of TEI research is largely due to its well-demonstrated relationship with various markers of psychological health (see Martins, Ramalho, & Morin, 2010), three of which were the focus of the present study: satisfaction with life (SWL), stress, and anxiety. SWL, or subjective well-being, is a holistic positive evaluation an individual makes about their life (Diener, 1984). Correlational research has consistently shown TEI to be predictive of life satisfaction (Extremera & Fernández-Berrocal, 2005), subjective well-being (Gallagher & Vella-Brodrick, 2008) and happiness (Furnham & Christoforou, 2007). Stress is exhibited as physical and mental tension (Lovibond & Lovibond, 1995), and TEI reliably predicts lower self-reported stress levels (Duran, Extremera, Rey, Fernandez-Berrocal, & Montalban,

2006) and lower biological stress responses under stressful conditions (Mikolajczak, Roy, Luminet, Fillée, & de Timary, 2007; Salovey, Stroud, Woolery, & Epel, 2002). Finally, anxiety encompasses autonomic arousal and situational worry and fear (Lovibond & Lovibond, 1995) and TEI has been consistently correlated with lower self-reported anxiety (e.g. Mikolajczak, Luminet, Leroy, & Roy, 2007; Siegling, Vesely, & Saklofske, 2013).

While correlational research methods within cross-sectional study designs disallow causal interpretations and leave the field open to criticism (Zeidner & Olnick-Shemesh, 2010), experimental research has demonstrated that, compared to low TEI individuals, high TEI individuals experience a smaller increase in negative mood following a laboratory stress induction compared to low TEI individuals (Mikolajczak et al., 2009). While this finding is crucial for demonstrating the benefit of TEI in the context of stress, it is yet to be seen if this benefit lasts over a longer timeframe. Austin, Saklofske and colleagues conducted multiple longitudinal studies on university students throughout the academic year, one of which demonstrated that TEI, coping strategies and stress scores at the beginning of the year could predict end-of-year academic achievement (Saklofske, Austin, Mastoras, Beaton, & Osborne, 2012). An earlier study assessed stress twice, at the start of the academic year and again before final exams, and found that together, TEI and coping directly predicted lower trait stress, and indirectly predicted lower state stress at both time points (Austin et al., 2010).

The aim of the current study was to extend these findings by determining whether TEI can predict *changes* in stress and anxiety throughout a stressful academic year. The methods utilised in the current study are methodologically and statistically more thorough than prior research, to allow for a more precise understanding of the processes, using change scores as outcome measures. While often touted as similar methodological approaches, analysis of covariance (ANCOVA) models and change score analyses address fundamentally different hypotheses (Knapp & Schafer, 2009). In the current study we wished to examine individual

progression over time, relative to each person's baseline, not a baseline group average (as is fundamental to ANCOVA). Change scores allowed us to investigate individual reactions to stress, thus moving an important step beyond previous work (e.g., Mikolajczak, Luminet, & Menil, 2006; Mikolajczak et al., 2009).

Further, rather than grouping stress and anxiety into a general psychological distress category (e.g., see Bhullar, Schutte, & Malouff, 2012), we kept all three outcomes (stress, anxiety and SWL) separate. This was partly due to the distinct conceptual and empirical nature of stress and anxiety (Lovibond & Lovibond, 1995), and partly due to the novel longitudinal aspect of the current study. Specifically, while we hypothesized similar patterns of associations between TEI and each of stress and anxiety, given that this is the first study of its kind to investigate these associations in detail, we wished to keep the outcomes distinct. Thus, our first aim was to examine whether TEI was predictive of changes in stress, anxiety and SWL in the context of a stressful life event.

Potential Mechanisms Underpinning TEI

The second aim of the current study was to explore the underlying mechanisms that might be responsible for any potentially adaptive effects of TEI throughout a stressful year. Trait TEI is conceptualized not as a collection of objective emotion-related skills or abilities (which instead is ability emotional intelligence; Mayer, Salovey, & Caruso, 2004), but as a dispositional construct involving positive emotional self-belief and self-regulation. As mentioned earlier, experimental work has shown that TEI predicts mood change (Mikolajczak et al., 2009); the next step is to understand the mechanisms at work. Clearly, if TEI is effective in reducing psychological stress, it is important to discover how it has this effect, and identify the kinds of behaviours that may mediate the relationship between what is argued to be a personality disposition, and adaptive outcomes in response to stress. We posit that the

answer lies in the specific coping and cognitive strategies used by high TEI individuals, which are described below.

Coping styles. Coping comprises a variety of behaviours that individuals engage in to deal with threatening situations (Carver, Scheier, & Weintraub, 1989). Research has demonstrated the utility of different coping styles in adaptive stress responses; indeed, this is the context within which models of coping were developed (Lazarus & Folkman, 1984). Although there are multiple approaches to measure coping styles, the most common is to contrast two broad styles, active and avoidant coping. Active coping (also called problem-focused coping) comprises strategies to actively address the problem, and is associated with positive affect and well-being (Ben-Zur, 2009; Park, Armeli, & Tennen, 2004). Avoidant coping includes strategies such as mental and physical distraction, which do not actively engage with, but rather avoid, the present problem, and is generally maladaptive (Frydenberg & Lewis, 2009). TEI has demonstrated positive and negative associations with active and avoidant coping respectively (Alumran & Punamaki, 2008; Matthews et al., 2006).

While some previous longitudinal research has grouped TEI and coping styles together via factor-analysis (Saklofske, Austin, Galloway, & Davidson, 2007), we prefer instead to view coping styles as potentially explaining the effect of TEI. As noted, TEI measurement tools do not measure specific behaviours or skills, but rather an underlying disposition to behave. Coping styles questionnaires, in contrast, assess specific behaviours that individuals engage in when experiencing stressful events. Given this, we would argue that having high dispositional TEI inclines individuals to use more active coping, and less avoidant coping, when they are experiencing stressful events.

Emotion regulation. The emotion regulation literature investigates specific processes that individuals engage in to actively change their emotional experience. Despite the conceptual similarities between TEI and emotion regulation (ER) (e.g., Feldman Barrett &

Gross, 2001), there has been surprisingly little research into the nature of the association between them. ER researchers typically investigate a range of strategies, and three of the most commonly studied were investigated here: specifically, rumination, cognitive reappraisal and expressive suppression. Rumination is the process of “repetitively and passively focusing on symptoms of distress and on the possible causes and consequences of these symptoms” (Nolen-Hoeksema, Wisco & Lyubomirsky, 2008, p. 400), and has been theoretically and empirically correlated with low TEI (Petrides, Pérez-González & Furnham, 2007). Reappraisal involves re-evaluating an emotion-eliciting stimulus in a way that changes the emotional response; and suppression involves the active inhibition of the expression of felt emotion (Gross & John, 2003). Reappraisal and suppression have been positively and negatively correlated with TEI respectively (e.g., Beath, Jones, & Fitness, in press; Chapter 4), and a substantial amount of research has demonstrated that reappraisal is one of the most effective regulatory strategies for processing negative emotions such as anxiety and dealing with stressful events, while suppression is disadvantageous (e.g. Ochsner & Gross, 2008; Richards, 2004).

Given that each of these ER strategies involve specific behaviours, we argue that they might explain the TEI-psychological distress relationship the same way as coping styles, and thus explain why TEI is beneficial. Specifically, we hypothesized that, compared to lower TEI, higher TEI would be associated with increased use of reappraisal and decreased use of suppression and rumination, which would in turn be associated with smaller increases in stress and anxiety and smaller decreases in SWL throughout a stressful year.

Personality. Given it is a dispositional construct itself, TEI has repeatedly been theoretically and empirically linked to the personality traits that constitute the five factor model (FFM). Researchers have shown that high TEI individuals display lower neuroticism and higher extraversion, agreeableness, openness to experience and conscientiousness

(Petrides, Pita, & Kokkinaki, 2007; Shulman & Hemenover, 2006). While some researchers have argued that TEI is nothing more than a combination of socially-desirable personality traits (e.g. Mayer, Salovey, & Caruso, 2008), recent meta-analyses have demonstrated the extent of the relationships between TEI and personality traits were moderate at best (Beath, Jones, & Fitness, 2015; Chapter 2; Joseph & Newman, 2010). While this does not lessen the usefulness of TEI, it does reinforce the need to control for shared personality effects when conducting TEI research. Accordingly, in the current study we aimed to control for the relevant FFM traits when assessing the predictive utility of TEI.

The Current Study

In summary, the first aim of the current study was to extend previous research (Austin et al., 2010) by using TEI to predict changes in stress, anxiety and SWL at three time points during a particularly stressful academic year: baseline (pre-stress), during stress, and recovery (post-stress). There were several benefits to using the one academic year: It provided a realistic stressor within an ecologically valid context, and gave us control over the nature of the stressor with which all students were objectively dealing, despite inevitable differences in perceived stress (see also explanation in Method section). The second aim of the study was to investigate the role of specific coping styles and emotion regulation strategies as mechanisms underpinning the effects of TEI on changes in stress, anxiety and SWL.

Our first hypothesis was that self-reported stress and anxiety would increase from baseline to the stress time point, and decrease from stress to the recovery time point (H1a), and similarly, that SWL would decrease from baseline to stress, then increase to recovery (H1b). Second, we hypothesized that TEI would predict lower stress and anxiety (and higher SWL) at each time point. Third, we hypothesized that, compared with low TEI, high TEI individuals would show a smaller increase in stress and anxiety (and a smaller decrease in SWL) from baseline to the stress time point, and a smaller decrease in stress and anxiety from

stress to recovery (a smaller increase in SWL) (H3). Finally, we hypothesised that the association between TEI and changes in stress, anxiety and SWL over time would be explained by ER and coping: Specifically, and controlling for personality, higher TEI would be associated with increased active coping and reappraisal, decreased avoidant coping, suppression and rumination, and consequently, a smaller increase in stress (H4a) and anxiety (H4b) (and a smaller decrease in SWL, H4c) over time.

Method

Participants

Complete data were collected from 83 students (59 females, 24 males) from two cohorts in consecutive years, each completing their Honours ($n = 66$, 79.5%) or Post Graduate Diploma ($n = 17$, 20.5%) in Psychology at Macquarie University (Australia). These students had previously completed a three-year Bachelor's degree (or equivalent) in Psychology and were currently undertaking their fourth year of tertiary study, which requires completion of a major empirical research thesis as well as coursework. This year of study is deemed highly stressful by students (see Results section for supportive data), and thus provides an appropriate, consistent and identifiable stressor for the current study, as well as a point of comparison from previous empirical work (Mikolajczak et al., 2009; Saklofske et al., 2012). Participants ranged from 20 to 53 years of age ($M = 24.93$, $SD = 6.82$), and 84% worked in gainful employment while studying full-time (of those participants who worked, mean hours working per week = 14.87, $SD = 8.71$).

Measures

TEI. TEI was measured with the total score of the Trait Emotional Intelligence Questionnaire (Petrides, 2009), a soundly constructed, well validated and widely used 153-item measure of TEI (e.g., "I can identify an emotion from the moment it starts to develop in

me”). Participants were instructed to answer questions on 7-point scales, 1 = *completely disagree* to 7 = *completely agree*.

Although the TEIQue provides a continuous score of TEI, we found consistent non-linear associations between TEI and reported stress (see Figure 1). Given this, TEI was recoded into tertiles (lowest third, middle third, highest third TEI scores in the sample) and treated as categorical for all analyses, although only monotonic trends across tertiles are considered as supporting our hypotheses. Categorisation of the TEIQue was consistent with previous work in the field (e.g., Petrides & Furnham, 2003; Mikolajczak, Roy, Verstrynge & Luminet, 2009) and allowed effects to be intuitively interpreted in line with the previously specified hypotheses.

Personality. Neuroticism, extraversion, agreeableness, openness and conscientiousness measures were taken from the International Personality Item Pool (Goldberg et al., 2006), with 20 items per construct. These scales were based on the NEO-PI-R (Costa & McCrae, 1992). Questions asked participants to describe themselves as they are now, compared to others of the same age and gender, on 5-point scales, 1 = *very inaccurate* to 5 = *very accurate*.

Emotion regulation. Individual differences in reappraisal, suppression, and rumination were assessed. Reappraisal and suppression were both measured by the Emotion Regulation Questionnaire, a reliable and valid measure of how individuals typically control their emotions (Gross & John, 2003), with six and four items respectively. Rumination was measured via the 12-item subscale of the Rumination-Reflection Questionnaire (Trapnell & Campbell, 1999), with instructions asking participants to respond according to what they think and feel about themselves on 7-point scales (1 = *strongly disagree*, 7 = *strongly agree*).

Coping styles. Coping styles were measured with items from the COPE inventory (Carver et al., 1989), using Lyne and Rodger’s (2000) scoring method to create two factors:

18 items assessing active coping, measuring rational and non-impulsive behaviours (e.g., “I do what has to be done, one step at a time”), and 10 items assessing avoidant coping, measuring helplessness and disengagement (e.g., “I admit to myself that I can’t deal with it and stop trying”). Instructions directed participants to respond according to what they do when experiencing a stressful event and response options ranged from 1 (*I usually don’t do this at all*) to 4 (*I usually do this a lot*).

Stress and anxiety. Stress and anxiety were measured by the Depression, Anxiety and Stress Scale (DASS; Lovibond & Lovibond, 1995), with 14 items for each of stress and anxiety, asking participants to answer based on how they have been feeling over the past week, with responses ranging from 0 (*did not apply to me at all*) to 3 (*applied to me very much, or most of the time*). Stress items assessed nonspecific nervous arousal (e.g., “I found it difficult to relax”), whereas anxiety items measured specific physiological arousal and affective anxiety (e.g., “I was aware of the dryness of my mouth”).

Satisfaction with life. The Temporal Satisfaction with Life Scale (Pavot, Diener, & Suh, 1998) assessed satisfaction with the individual’s past (e.g., “If I had my past to live over, I would change nothing”), present (e.g., “I am satisfied with my current life”) and future (“I will have the important things I want in the future”) on a 7-point scale (*strongly disagree* to *strongly agree*), five items per subscale, which also summed to a total score. We chose to administer this scale instead of a unidimensional SWL scale because we theorised there might be differences in how satisfied participants felt with their present versus future, given the year-long time period of the academic stress they were experiencing.

Stress, anxiety and SWL change scores were computed by subtracting time 1 scores from time 2, and expressing the difference as a percentage of time 1, which is referred to here as change 1. The equivalent calculation for the difference between times 2 and 3 is referred to as change 2. As discussed in the introduction, change scores are the appropriate analytic

technique as they directly measure individual trajectory, which is directly what our hypotheses are concerned with. In contrast, statistically controlling for time 1 stress when predicting time 2 via ANCOVA models does not allow for the assessment of individual trajectories over time, but rather assessed time 2 scores as if all individuals had the same time 1 score.

Procedure

Data were collected online at three time points throughout the year. Time 1 (baseline) was at the beginning of academic the year, before coursework subjects had begun and when students had generally just begun work on their theses. At this time the workload is relatively light with distant deadlines. TEI, personality, emotion regulation, coping, stress, anxiety and SWL measures, as well as demographics, were assessed at Time 1, and 126 participants completed surveys at this point (72% of the entire student cohort). Time 2 (during stress) was later in the year, a month before their empirical theses were due for submission. This time was chosen as students are facing imminent deadlines for the major assessment item (worth 60% credit) of their degree. Stress, anxiety, SWL and coping were measured again at Time 2, with 101 students responding. Time 3 (recovery) measures were taken at the end of the year, once theses had been submitted and all coursework final assessments were finished, but before final results had been released to students, and 93 participants responded. Stress, anxiety, SWL and coping were measured again at time 3. 83 participants provided complete data that could be matched over all three time points,¹ and only these data are reported in the results section. There were no significant differences between those who did and did not complete all time points for TEI, stress, anxiety or SWL raw scores, or stress, anxiety or SWL change scores (biggest $F(1,91) = 1.198$, smallest $p = .277$)

¹ Participants were given an anonymous ID when they first signed up for the study, which was used to match their responses across the three time points. However, some participants incorrectly entered this ID when completing the survey; thus, while 93 participants completed all three time points, responses from only 83 participants could be matched and analysed.

Results

Descriptive Statistics

Of the 83 participants, 28 formed the low TEI group (TEIQue $M = 4.11$, $SD = 0.39$), 30 formed the mid TEI group ($M = 4.98$, $SD = 0.12$), and 25 formed the high TEI group ($M = 5.64$, $SD = 0.19$). Raw scores for stress, anxiety and SWL can be seen in Table 1. Mean stress scores were higher than comparable Australian samples, both student (Lovibond & Lovibond, 1995) and community young adult (Crawford, Cayley, Lovibond, Wilson, & Hartley, 2011), particularly at time 2, which provides validation of the stressful nature of the academic year. Stress and anxiety increased on average from time 1 (T1) to time 2 (T2), and decreased again by time 3 (T3), supporting Hypothesis 1a. SWL scores, while in the expected direction, changed only very slightly across time points, and thus did not support Hypothesis 1b.

Table 1

Descriptive statistics for stress, anxiety and SWL

Outcome	<i>M (SD)</i>		
	Time 1	Time 2	Time 3
Stress	11.63 (8.75)	15.20 (9.90)	11.72 (9.91)
Anxiety	4.19 (5.35)	6.17 (7.00)	4.69 (7.00)
SWL past	21.50 (7.34)	21.62 (7.52)	22.38 (7.18)
SWL present	25.18 (6.76)	23.73 (7.55)	24.82 (7.26)
SWL future	25.20 (5.35)	25.71 (5.99)	25.45 (5.79)
SWL total	71.80 (16.41)	70.92 (17.16)	72.46 (16.97)

Note. M = mean, SD = standard deviation.

Bivariate Associations

EI and outcomes. Differences across TEI tertiles in outcomes and other predictor means were assessed via Analyses of Variance (ANOVAs) and General Linear Models (GLMs). When predicting change 2 scores in GLMs, the relevant change 1 score was added as a covariate, in order to be consistent with subsequent path models. Associations between continuous predictor and outcomes (raw scores and change scores) were assessed using

Pearson’s correlations. Correlations produced for change 2 scores were partial correlations, controlling for the relevant change 1 score, to be consistent with path models.

As expected, high TEI participants experienced significantly less stress than mid and low TEI participants at all three time points. Unexpectedly, however, they also experienced a significantly greater increase in stress from T1 to T2 (see Figure 1 and Table 2).

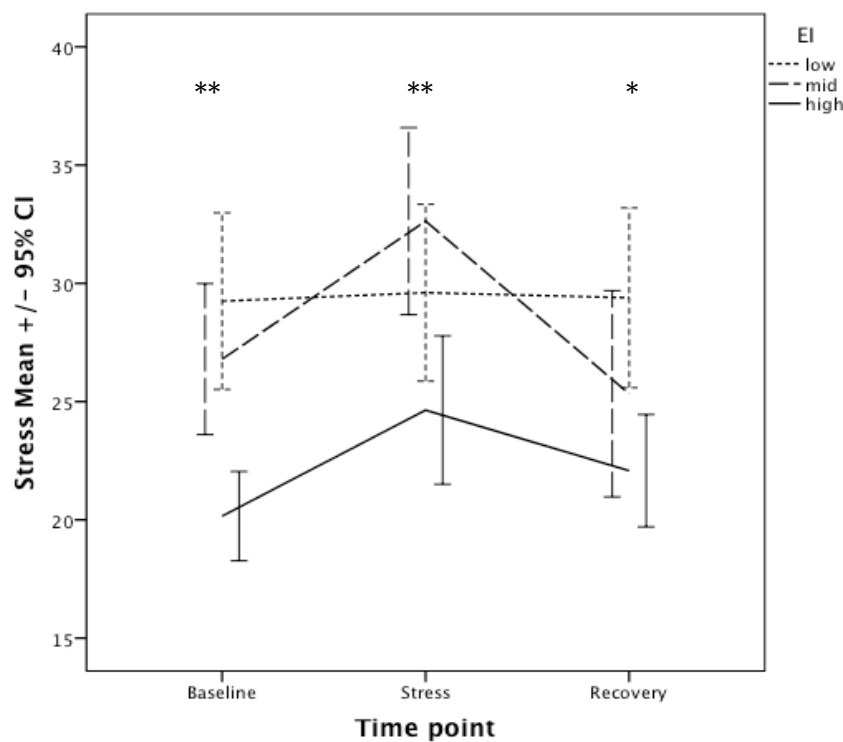


Figure 1. Stress scores across three time points by TEI group. * Mean raw stress scores significantly different across TEI category, $p < .05$. ** Mean raw stress scores significantly different across TEI category, $p < .01$.

Table 2

Stress, anxiety and SWL change scores by TEI tertiles

Outcome	Low TEI	Mid TEI	High TEI	$F(2,80)$	η_p^2
Stress					
Change 1	3.94 [-8.71, 16.59]	26.48 [14.26, 38.70]	25.26 [11.87, 38.64]	3.972*	.090
Change 2 ^a	4.76 [-9.64, 11.06]	-19.51 [-27.08, -7.50]	-7.15 [-15.95, 5.41]	3.237*	.076
Anxiety					
Change 1	16.00 [5.53, 26.72]	18.49 [8.37, 28.61]	0.80 [-10.28, 11.89]	3.119*	.072
Change 2 ^a	-7.05 [-14.11, 2.15]	-9.16 [-15.25, 0.55]	3.38 [-8.80, 8.81]	0.809	.020
SWL					
Change 1	0.79 [-5.31, 6.89]	-2.29 [-8.18, 3.60]	1.35 [-5.10, 7.81]	0.415	.010
Change 2	9.68 [3.81, 17.12]	1.23 [-7.00, 5.89]	1.63 [-4.16, 9.94]	2.899	.068

Note. Numbers in cells are means, with 95% confidence intervals in brackets underneath.

* $p \leq .05$. SWL = Satisfaction with life. ^a Change 2 analyses included the relevant change 1 score as a covariate.

TEI significantly predicted stress change 2 scores, where low TEI participants experienced no real change in scores, high TEI participants experienced a modest decrease in stress from T2 to T3, but mid TEI participants experienced a substantial decrease in stress for this period. A significant difference in anxiety T1 and T2 scores between TEI tertiles can be seen in Figure 2: High TEI participants experienced less anxiety, and also a smaller increase in anxiety between T1 and T2, when compared with mid and low TEI participants (T3 anxiety scores display the same pattern but only marginally significant, $p = .074$).

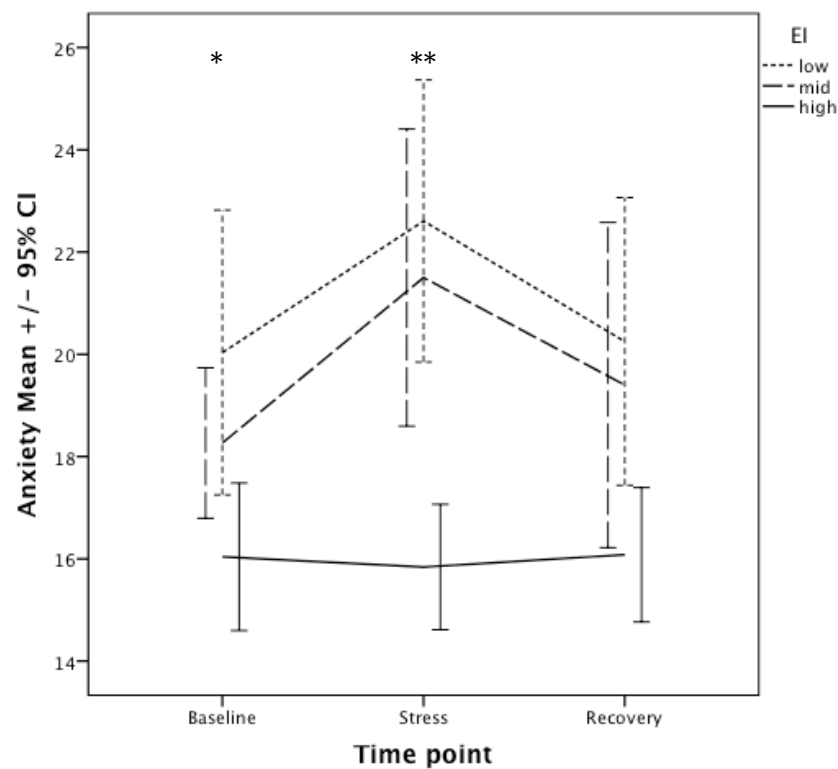


Figure 2. Anxiety scores across three time points by TEI group. * Mean raw anxiety scores significantly different across TEI category, $p < .05$. ** Mean raw anxiety scores significantly different across TEI category, $p < .01$,

While SWL raw scores were significantly positively associated with TEI at each time point (see Figure 3), the lack of substantial change in scores across time as seen in Table 2 results in no association between TEI and SWL change, and thus no further analyses involving SWL were conducted.

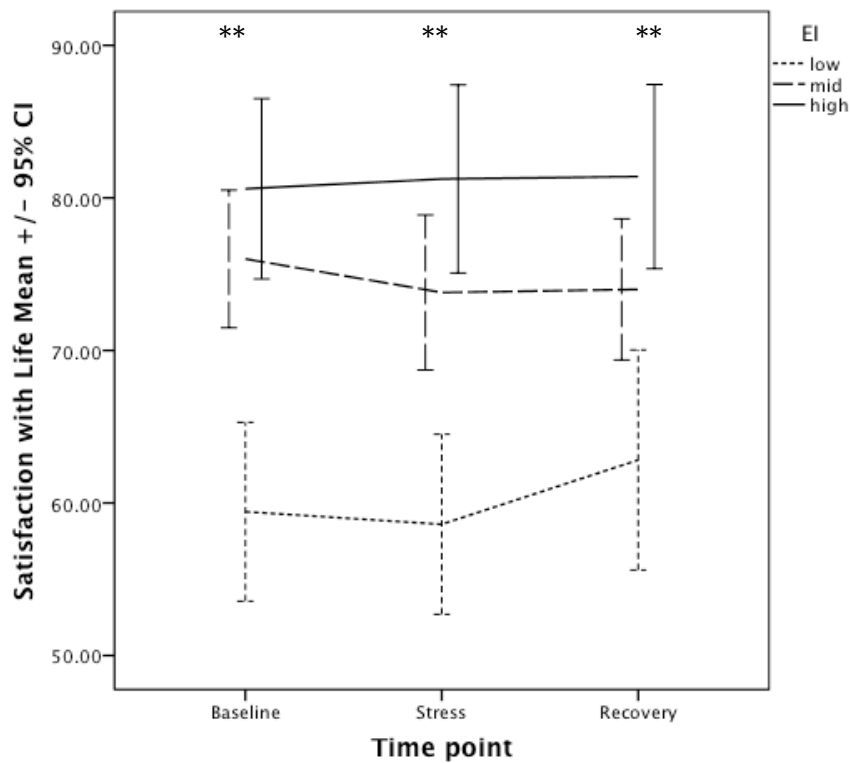


Figure 3. Satisfaction with life (SWL) scores across three time points by TEI group.

** mean raw SWL scores significantly different across TEI category, $p < .01$.

Other predictors and outcomes. While many of the emotion regulation, coping and personality variables were statistically significantly correlated with stress and anxiety raw scores (see Appendix B Table 1), fewer were correlated with stress and anxiety change scores. Both predictors correlated with anxiety change are theoretically dysfunctional, with neuroticism significantly associated with anxiety change 1 ($r = .216, p = .017$), and avoidant coping 1 significantly associated with anxiety change 2 ($r = -.280, p = .011$). Alternatively, all predictors significantly associated with stress change are theoretically functional: Stress change 1 was correlated with reappraisal ($r = .324, p = .003$), active coping 1 ($r = .224, p = .026$), extraversion ($r = .262, p = .017$) and agreeableness ($r = .258, p = .017$). No significant correlations were found for stress change 2.

TEI and other predictors. TEI was significantly related, in the expected direction, to all other predictors (see Table 3). This is consistent with previous research, and provides initial support for ER and coping explaining the effect of TEI on stress and anxiety.

Table 3

Associations between TEI tertiles and other predictors

Predictor	<i>F</i>
Five factor model of personality	
Neuroticism	25.264***
Extraversion	18.999***
Agreeableness	11.815***
Openness to Experience	6.478**
Conscientiousness	17.573***
Emotion Regulation	
Reappraisal	14.839***
Suppression	6.800**
Rumination	11.135***
Coping	
Active coping T1	23.831***
Active coping T2	16.917***
Active coping T3	11.951***
Avoidant coping T1	14.795***
Avoidant coping T2	8.674***
Avoidant coping T3	10.469***

Note. *F* with 2 and 80 degrees of freedom. ** $p < .025$ *** $p < .01$.

Path Models

Path modelling was conducted using Mplus version 7 (Muthén & Muthén, 1998-2012) and standard errors used in formal statistical inference were derived via the nonparametric bootstrap (with 2000 resamples) to correct for violation of the assumption of multivariate normality in all models. Categorical TEI was entered using two dummy variable predictors, low and mid TEI, allowing high TEI to be the reference group for all regression coefficients. Variables within each family of predictors (ER, coping, personality) were only included in path models if they had significant bivariate associations with both TEI and the change scores of interest. Although personality constructs are not conceptualized as explaining the effect of TEI, they were statistically treated as such in the models to be able to control for shared

effects of TEI and personality on the relevant outcome. Separate path models were fit for stress and anxiety and for each family of predictors (ER, coping and personality).

Basic TEI models. To test Hypothesis 3, models predicting change scores from TEI were fitted for stress and anxiety individually. Standardized path coefficients can be seen in Table 4. Contrary to predictions, high TEI participants experienced a significantly larger increase in stress from T1 to T2 compared with low TEI. Mid TEI participants experienced a greater decrease in stress from T2 to T3 than high TEI (though not significant at the $p < .025$ level). Finally, as predicted, high TEI participants experienced a significantly smaller increase in anxiety compared to mid and high TEI participants from T1 to T2. This provides partial support for H3.

Table 4

Standardized path coefficients from simple TEI path models

Path	Standardized effect ^a	
	β	95% CI
Stress		
Low TEI – change 1	-0.291**	[-0.529, -0.053]
Mid TEI – change 1	0.017	[-0.277, 0.331]
Low TEI – change 2	0.096	[-0.015, 0.438]
Mid TEI – change 2	-0.196*	[-0.388, -0.004]
Anxiety		
Low TEI – change 1	15.196**	[2.03, 28.362]
Mid TEI – change 1	17.685**	[3.161, 32.209]

Note. * $p < .05$. ** $p < .025$. ^a Due to dummy coding, coefficients refer to the pairwise differences between low (or mid) TEI and high TEI. Positive coefficients predicting change 1 indicate high TEI experience less of an increase in stress/anxiety than low (mid) TEI, whereas negative coefficients indicate high TEI experience more of an increase in stress/anxiety than low (mid) TEI. Predicting change 2, positive coefficients indicate high TEI experience more of a decrease than low (mid) TEI, whereas negative coefficients indicate high TEI experience less of a decrease than low (mid) TEI.

Stress change. Representing the emotion regulation family, reappraisal was fitted to potentially explain the effect of TEI on stress change. Reappraisal was found to fully explain the effect of TEI on stress change 1, in that the direct path regressing change 1 on low TEI, which was initially significant in the model without reappraisal, $\beta = -0.291$, 95% CI $[-0.529, -0.053]$, $p = .014$, became not significant with a decreased effect size when the indirect path via reappraisal was included, $\beta = -0.149$, 95% CI $[-0.447, 0.149]$, $t = -0.995$, $p = .320$. High TEI participants reported greater use of reappraisal, and in turn experienced a greater increase in stress from time 1 to time 2, compared with low TEI participants. Model fit indices of the path model were satisfactory, $\chi^2(3) = 4.450$, $p = .217$, RMSEA = .076, 90% CI $[0.00, 0.21]$, $pclose = .299$, CFI = 0.972, TFI = 0.915, SRMR = .051, indicating a good fit (see Figure 4). This model provides strong support for reappraisal explaining the effect of TEI on stress change, albeit in an unexpected direction, partially supporting H4a.

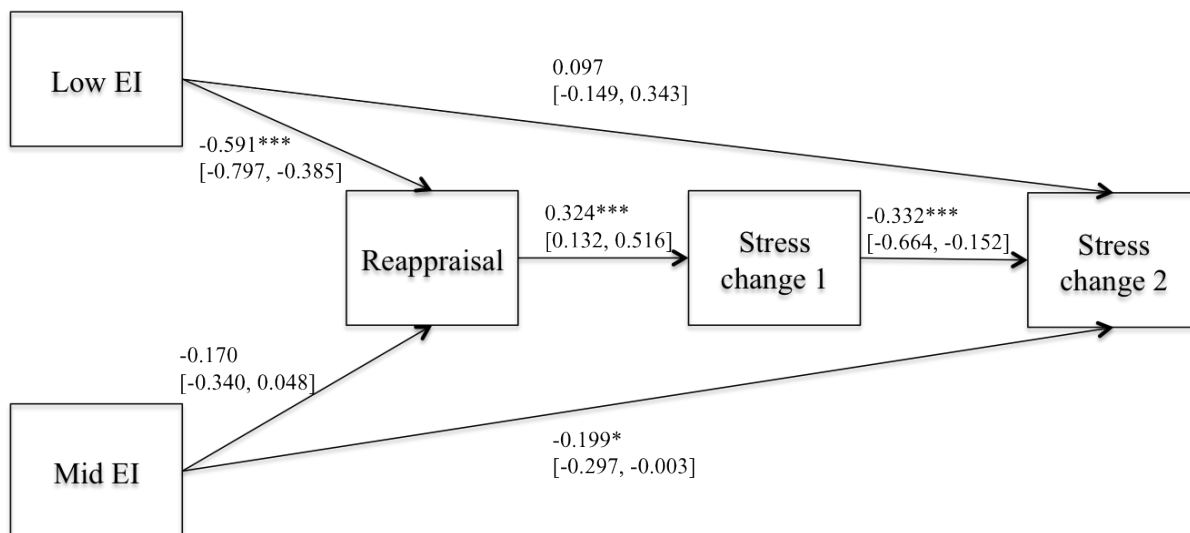


Figure 4. Path model predicting stress via reappraisal. Due to dummy coding, TEI is represented by two observed variables, and TEI paths represent the difference between low (mid) TEI and high EI, which is the reference group. Numbers on paths are standardized coefficients. Numbers in square brackets are 95% confidence intervals. * $p < .05$. *** $p < .01$.

Active coping 1 as well as agreeableness and extraversion were tested as explaining the effect of TEI on stress change 1. While the path regressing active coping on low TEI, $\beta = -0.724$, 95% CI [-0.882, -0.556], $t = -9.140$, $p < .001$, and the path regressing stress change 1 on active coping, $\beta = 0.244$, 95% CI [0.038, 0.450], $t = 2.366$, $p = .018$, were both significant and in the expected direction, Table 5 shows that the indirect and direct paths are difficult to disentangle, with both direct and indirect paths non-significant when both are included in the model. A similar result was found for the FFM model, where the direct effect of TEI on stress change was unable to be disentangled from the effect of extraversion and agreeableness. This provides some support for active coping explaining the effect of TEI on stress change, although the results are not as strong as the reappraisal model above. However, although an indirect path model was not tested (as there were no other predictor that had significant bivariate associations with stress change 2), TEI still significantly predicted stress change 2. These results provide partial support for H4a.

Table 5

Comparison of standardized direct and indirect effects of TEI on stress change 1

Mechanism	Total effect of low TEI		Direct low TEI path		Indirect path	
	β	95% CI	β	95% CI	β	95% CI
Active Coping 1	-.291**	[-.529, -.053]	-.185	[-.489, .119]	-.106	[-.304, .092]
Extraversion and agreeableness	-.292**	[-.532, -.052]	-.127	[-.399, .145]	-.165	[-.045, .045]

Note. ** $p < .025$.

Anxiety change. No emotion regulation or personality variables were significantly correlated with anxiety change 1, thus no path models were tested with those variables. Significant correlations were found between avoidant coping 1 and anxiety change 2, and avoidant coping 2 and anxiety change 1. When both avoidant coping variables were fit in the path model, coping 1 became non significant (likely due to the correlation between avoidant coping 1 and 2; $r = .531$, $p < .001$), so it was removed. Regressing avoidant coping on low

TEI: $\beta = 0.499$, 95% CI [0.289, 0.709], $t = 4.735$, $p < .001$; regressing anxiety change 1 on avoidant coping: $\beta = 0.233$, 95% CI [0.007, 0.459], $t = 2.066$, $p = .039$. However, as seen in Table 6, the direct and indirect effect of TEI could not be disentangled as both were non significant when the other was included. Thus, avoidant coping at time 2 partially explained the effect of TEI on anxiety change 1, where low TEI participants used more avoidant coping at the stress time point, and subsequently experienced more anxiety.

Finally, neuroticism was the only personality construct that was significantly correlated with anxiety change 1, thus tested in a path model. Once again, the direct and indirect effect of TEI was not clear (see Table 6), demonstrating a large association between TEI and neuroticism. These results provide partial support for H4b.

Table 6

Comparison of standardized direct and indirect effects of TEI on anxiety change 1

Mechanism	Total effect of low TEI		Direct low TEI path		Indirect path	
	β	95% CI	β	95% CI	β	95% CI
Avoidant Coping 2	0.253**	[.041, .465]	0.163	[-.084, .410]	0.090	[-.064, .244]
Neuroticism	0.253**	[.041, .465]	0.087	[-.207, .381]	0.167	[-.021, .355]

Note. ** $p < .025$.

Power calculations. Given the modest sample size used in our study, we conducted post-hoc power calculations using Monte Carlo methods following the procedures outlined in Thoemmes, MacKinnon, and Reiser (2010). When specifying effect sizes that are moderate to large (standardized effect = .40), statistical power for the key parameter, which was the indirect effect of TEI on stress and anxiety change via ER and coping, was found to be adequate at greater than 0.8 at the 0.05 (two-tailed) level of statistical significance. Given this, we concluded that the failure of statistical significance for this parameter was not due to inadequate sample size, but rather was due to the small indirect effect size.

Discussion

The results of this study demonstrated that TEI does predict not just concurrent stress and anxiety, but importantly, changes in stress and anxiety throughout an academically stressful year. This represents a significant advance on previous research, which has been conducted correlationally (Extremera, Durán, & Rey, 2009), experimentally (Mikolajczak et al., 2009) or longitudinally, to predict raw stress scores (Austin et al., 2010).

The patterns of association between TEI and the outcome measures of stress and anxiety were quite different, confirming the methodological distinction made between the two constructs. The anxiety results clearly supported our hypotheses: Higher TEI predicted lower anxiety raw scores at baseline and stress time points, as well as a smaller increase in experiences of anxiety from Time 1 to 2. Throughout the course of a stressful year, high TEI students were not only less anxious at Time 1, they maintained their lower levels of anxiety even when academic pressure increased and deadlines loomed. Low TEI students not only began the year with more anxiety, but they also experienced more anxiety when pressure increased.

In contrast, while high TEI individuals were less stressed overall than low TEI individuals, their stress levels increased more from Time 1 to 2, even though raw stress scores were lower for all three time points. The fact that overall stress increased throughout the year supports existing stress research that shows that increased arousal and perceived stress can be beneficial for task-specific performance (Hanoch & Vitouch, 2004; Welford, 1974). Given this, the increase in stress levels observed in the high TEI group may be an adaptive reaction to intellectual challenge. In line with this, previous research has found that when recalling a previously made bad decision, higher TEI individuals experienced a greater increase in negative affect than lower TEI individuals, even though at baseline TEI was correlated with lower negative affect (Sevdalis, Petrides, & Harvey, 2007). This previous study's results

mirror the present results, and together suggest that high TEI individuals experience greater negative emotional reaction than their low TEI counterparts, when their negative affect is lower to begin with. This emotional arousal could act as a motivating factor in the context of learning from a bad decision (Sevdalis et al., 2007) or when faced with a high-demand task (as in the current study). In contrast, the low TEI group began the year close to ceiling point for stress, so did not and possibly were not able to display the same increase from time 1 to 2 (see Figure 1), consistent with the principle of allostatic load (McEwen, 1998). Further, high TEI individuals' lower baseline stress, which preceded the greater increase in stress, can explain the apparent discrepancy between these results and previous literature (Mikolajczak et al., 2006). As mentioned earlier, the ANCOVA methods used in Mikolajczak and colleagues' study assessed change by predicting follow-up scores given an average baseline score. If high TEI individuals are typically less stressed than average at baseline, then the ANCOVA-estimated increase in stress will be less extreme from the relatively higher baseline point compared to that estimated via change scores.

Importantly, this increase in stress for high TEI participants was not coupled with a similar increase in anxiety. While their stress increased, their anxiety scores were almost identical at Time 1 and 2, which further supports the explanation of increased reported stress as an adaptive response to the situation. This is consistent with research that has found TEI moderated the effects of stress and anxiety on SWL: For individuals with high TEI, increasing psychological distress was less predictive of decreasing SWL, compared with low TEI individuals (Bhullar et al., 2012). Together with the current findings, this suggests that high TEI individuals are less negatively affected by stress than low TEI individuals, who instead respond to stress with higher levels of anxiety. Given that SWL did not change over time in the current study, we were unable to explore how changes in stress and anxiety affected SWL. In fact, the SWL scores of the present sample were similar to a general

university student sample (Pavot et al., 1998), demonstrating that the SWL measure did not adequately assess students' levels of distress, unlike the stress and anxiety measures. Future research should utilise a more sensitive SWL to adequately assess longitudinal effects.

Another unexpected finding was the pattern of non-linear associations between TEI and stress, which demanded categorization into low, mid and high TEI for the purposes of these analyses. Mid TEI participants had the highest increase in stress from Time 1 to 2, and correspondingly the greatest decrease in stress from Time 2 to 3; see Figure 1 and Table 2. Like those high in TEI, the mid TEI participants respond to the stressful task by feeling increasingly stressed, but as they begin the year higher in stress than the high TEI group, they similarly ended up higher at Time 2, and decreased more steeply at Time 3. Importantly, also like the high TEI group, their increasing feelings of stress did not correspond with greater feelings of anxiety. Because the TEIQue was created as a continuous measure (Petrides, 2009), we are hesitant to make strong conclusions about the mid TEI group based on the categorization, instead drawing the strongest conclusions from the low versus high TEI comparisons. However, if the non-linear patterns of association are replicated in future research, one could assume different underlying processes exist for high, mid and low TEI individuals.

How Does TEI Help Adaptive Reaction to Stress?

While TEI research has consistently demonstrated the predictive utility of TEI for psychological health (Martins et al., 2010), research to date has only started to identify the causes of this association. Being a dispositional construct, it is likely that high TEI inclines individuals to use specific strategies that benefit their reaction to stressful contexts, and we found evidence to support this.

In particular, cognitive reappraisal was demonstrated to play an important role in the effect of TEI on stress change. While other research has demonstrated a positive correlation

between TEI and reappraisal (Schutte, Manes, & Malouff, 2009) and reappraisal has accounted for the association between TEI and distress cross-sectionally (Beath et al., in press; Chapter 4), this is the first study to our knowledge to demonstrate that reappraisal explains the stress increase experienced by high TEI individuals in the context of a stressor. Like TEI, reappraisal was negatively associated with raw stress at baseline, but predicted an increase in stress from baseline. This shows that high TEI participants reappraise more, and subsequently experience more stress at the high-pressure time point compared to when they began the year, but again this increase in stress is not associated with a similar increase in anxiety (in fact, reappraisal had a small though non-significant negative correlation with anxiety change 1).

There was some evidence that active and avoidant coping explained the effects of TEI on stress and anxiety respectively. Like reappraisal, use of active coping at Time 1 predicted more stress, but not more anxiety, from Time 1 to 2. Increased use of avoidant coping at Time 2 predicted a greater increase in anxiety from Time 1 to 2, and partially explained the effect of TEI on anxiety change. Low TEI students used more avoidant coping than high TEI when under stress, and thus experienced a larger increase in anxiety when academic pressure increased. Unfortunately, results were not conclusive, as both direct and indirect effects were not significant in the model that included both. While TEI and coping have been previously linked in the literature (e.g. Saklofske et al., 2012), this study is the first of our knowledge to suggest indirect effects on stress and anxiety over time.

Emotion regulation theorists stress the importance of context when considering the benefit or detriment of ER strategies (Aldao, 2013), and the same can be said for coping styles (Carver, Scheier, & Fulford, 2008). The most adaptive way to cope with stress is dependent on situational demands: No particular strategy is consistently beneficial or detrimental across all situations. Our results support this idea, as reappraisal and active

copied predicted an increase in stress, but not anxiety, under a stress- and anxiety-provoking situation, which stands in contrast to work in other fields. The process of engaging in self-initiated reappraisal requires cognitive flexibility, which is an important factor in psychological health (see Kashdan & Rottenberg, 2010, for a review). Given this, it is possible that individuals who tend to use more reappraisal and active coping are more cognitively engaged with the high-demand nature of the academic year, which in turn makes them more stressed, relative to their baseline.

Limitations and Directions for Future Research

While this study is novel in many respects, there are some acknowledged limitations. The lack of change in SWL subscale and total scores across time was disappointing, as was the lack of clear differentiation of direct and indirect paths in the path models. In addition, ideally we would include coping and ER in the same model, to see whether one or both is of greater importance in predicting changes in stress, while also controlling for personality factors. While the use of such a targeted sample was beneficial for an applied investigation of the phenomena of interest, it did limit the sample size. Future research should therefore aim to replicate this study with a larger sample size, in order to control for personality while investigating the mediating effects of coping and ER on stress and anxiety in the same model.

Despite this, we have shown that TEI is beneficial for individuals experiencing a stressful life event. In comparison to low TEI, high TEI individuals reported a greater increase in stress over a stressful year, but they also reported less anxiety. This in turn may have been a function of their tendency to regulate their emotions via reappraisal, and to cope with stress via active, rather than avoidant, behaviours.

Understanding the mechanisms underlying the effect of TEI on stress and anxiety is particularly important in the context of interventions: As TEI is a stable construct, as indicated by its dispositional nature, it is less amenable to change if we want to attempt to

increase individuals' ability to cope with stressful situations. Instead, by understanding what makes high TEI individuals better able to cope with stress, we can identify strategies that can be encouraged in individuals. Research can investigate how best to target experiences of anxiety for low TEI individuals. Indeed, much experimental work instructing reappraisal use has demonstrated its benefit in stressful contexts (e.g. Oschner & Gross, 2008), in relation to negative affect like anxiety. These results have furthered TEI research by demonstrating its predictive utility for psychological distress, and understanding the mechanisms at work.

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Chapter 4: Psychological Distress, Emotion Regulation and Coping: Measurement Variance in TEI Scales

The previous chapter illustrated that reappraisal and, to a lesser extent, coping played important roles in understanding how TEI predicts changes in stress and anxiety. However, because of the limited sample size (due to the specific population investigated and the longitudinal study design), there were some limitations to the analyses that could be performed given the reasonably small effect sizes. In particular, emotion regulation and coping could not be considered in the same model, and thus the *unique* role that each played could not be investigated. Further, the results of the meta-analysis in Chapter 2 demonstrated systematic differences in the associations between personality and different TEI scales, suggesting that different scales might be assessing different facets of the TEI construct. The TEIQue was used as the measure of TEI in the study in the previous chapter, based on its use in the previous work that the study followed on from, but it is questionable whether similar results would be obtained using other TEI scales. Given the results of Chapter 2, it is reasonable to expect that there might also be differences in how TEI scales predict distress, and differences in the roles that emotion regulation and coping play in that association.

Thus, the present chapter presents a large-scale online study that investigated the association between three different TEI scales and psychological distress, to see which of the scales would be better at explaining individual differences in distress, and why. This study also directly compares the effects of emotion regulation and coping styles in order to better understand their comparative importance. Further, this comparative importance can be investigated across three TEI scales. In summary, this chapter addressed Aims 1 and 2 of the thesis, by exploring measurement issues of TEI as well as further clarifying potential mechanisms of the TEI – distress association.

I was the major contributor to this co-authored paper. The concepts behind the study were mine. I collected the data and ran the analyses, with help from Michael Jones. I drafted

the first version of the manuscript, and both Michael Jones and Julie Fitness provided feedback and suggestions on multiple versions of the manuscript.

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Psychological distress, emotion regulation and coping:

Measurement variance in trait EI scales

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Abstract

High trait emotional intelligence (TEI) is negatively associated with psychological distress, and researchers have been investigating the roles of emotion regulation strategies and coping styles in this association. However, a confusing variety of TEI scales are in use, and studies suggest that systematic differences may exist between them. Thus, the aim of this study was to examine the extent to which coping styles and emotion regulation strategies (reappraisal and suppression) explain the EI-distress association using three TEI scales: the Trait Emotional Intelligence Questionnaire (TEIQue), the Assessing Emotions Scale (AES) and the Wong and Law Emotional Intelligence Scale (WLEIS). Participants ($N = 423$) were recruited online (59% resided in India, 36% the USA, 5% elsewhere). Structural equation modelling showed that both the TEIQue and AES were negatively associated with distress, mostly via avoidant coping, and with a stronger direct EI-distress path in the TEIQue model. In contrast, the WLEIS showed a weaker overall relationship with distress, but a greater number of indirect paths (i.e., negatively predicting distress via less avoidant coping and more reappraisal; positively predicting distress via more suppression and religious coping). Implications of the use of different TEI scales in clinical research are discussed.

Keywords: trait emotional intelligence; measurement; coping; emotion regulation; stress; anxiety

Psychological distress, emotion regulation and coping: Measurement variance in TEI scales

Empirical studies have reliably demonstrated that high trait emotional intelligence (TEI) is associated with lower stress and anxiety (Palmer, Donaldson, & Stough, 2002). Some work has suggested that this may be due to high TEI individuals' use of adaptive coping styles (Austin, Saklofske, & Mastoras, 2010). Various kinds of emotion regulation strategies (ER) have also been associated with TEI (Schutte, Manes, & Malouff, 2009), and explain differences in distress in their own right. To date, however, no research has investigated the extent to which both coping and ER might explain the TEI-distress link. Further, recent work has shown systematic differences in TEI measurement tools, which suggests that different scales might not be measuring the same construct (Beath, Jones, & Fitness, 2014a; Chapter 2). Thus, the aims of the current study were to examine the extent to which coping styles and ER strategies might explain the TEI-distress link, using three, different, TEI scales. Variation in the findings across scales would imply that they might be tapping into different mechanisms to protect against distress, providing evidence in turn for heterogeneity in the adaptive features of TEI.

TEI and Psychological Distress

TEI is a constellation of emotion-related dispositions and self-perceptions (Petrides, Furnham & Frederickson, 2004). A number of studies have explored the predictive utility of TEI in relation to psychological distress (van Heck & den Ouden, 2008; Zeidner, Matthews, & Roberts, 2012), with a recent meta-analysis reporting the average correlation between TEI and mental health to be $r = .36$ (Martins, Ramalho, & Morin, 2010). Given that TEI assesses general emotional dispositions, we argue that the mechanism through which this relationship works is via more proximal behaviours and dispositions such as coping styles and ER strategies. Coping styles comprise a range of individual dispositions to behave in response to stressful situations (Carver, Scheier, & Weintraub, 1989), with high TEI individuals more

likely to use active, problem-focused behaviours and less likely to use avoidant behaviours than low TEI individuals (Saklofske, Austin, Mastoras, Beaton, & Osborne, 2012). Different ER strategies are also associated with TEI; in particular, suppression and reappraisal. Suppression (a generally maladaptive strategy) refers to the act of inhibiting external emotional displays; reappraisal (a generally adaptive strategy) involves altering the interpretation of the emotion-eliciting event in order to change the emotional experience (Gross & John, 2003). Suppression and reappraisal have been negatively and positively linked to TEI respectively (Schutte et al., 2009). However, different TEI scales are differentially associated with these constructs, suggesting that they may each be measuring different facets of TEI. Specific associations between different TEI scales and both coping and ER strategies are reviewed below.

TEI Scales

There are a number of distinct TEI measures in use, and while correlations between them vary, they are generally lower than would be expected if all scales were assessing the same construct (e.g., Austin, Saklofske, & Egan, 2005). A recent meta-analysis of associations between various TEI scales and the five factor model (FFM, consistently associated with TEI) suggested that the scales could be grouped into three categories (Beath et al., 2014a; Chapter 2): TEI scales with the strongest correlations with personality (the Trait Emotional Intelligence Questionnaire, TEIQue; Petrides, 2009; and the Emotional Quotient Inventory, EQ-i; Bar-On, 1997); scales with the weakest correlations (Wong and Law Emotional Intelligence Scale, WLEIS; Law, Wong, & Song, 2004; and the Swinburne University Emotional Intelligence Test, SUEIT; Palmer & Stough, 2001); and scales with moderate correlations (e.g., the Assessing Emotions Scale, AES; Schutte et al., 1998). This systematic variation in correlations between TEI scales and personality suggests that these instruments are tapping into different aspects of the TEI construct. In the present study, we

aimed to ensure that our findings in relation to the mechanisms underpinning the relationship between TEI and psychological distress would be generalizable and not simply reflective of one aspect of TEI; thus, we selected the most widely used scale from each of these three groups: the TEIQue, AES and WLEIS. These three scales differ in their conceptual backgrounds, which further suggests that they might be tapping into different sub-constructs of TEI.

AES. The Assessing Emotions Scale (Schutte et al., 1998, also referred to as the SEIS) was designed to measure TEI in line with Mayer and Salovey's (1997) ability framework, which conceptualises emotional intelligence as a set of objective, demonstrable skills. The AES measures self-perceptions of emotional ability, emotion regulation, and emotional utilisation in the individual and others. While there was no factor structure originally proposed for the scale, some researchers have found four underlying factors (e.g., Saklofske, Austin, & Minski, 2003). Significant low to moderate associations between the AES and each FFM trait have been obtained (e.g., Bastian, Burns, & Nettelbeck, 2005; Koydemir & Schütz, 2012). The average correlation between the AES and mental health is reported as $r = .28$ (Martins et al., 2010). The AES has been positively associated with planning-focused coping (Por, Barriball, Fitzpatrick, & Roberts, 2011) and negatively associated with ruminative, emotional coping (Saklofske, Austin, Galloway, & Davidson, 2007). Finally, this scale has been moderately correlated with greater reported use of reappraisal and less suppression (Schutte et al., 2009).

WLEIS. The Wong and Law Emotional Intelligence Scale (WLEIS; Wong & Law, 2002) was also developed according to Mayer and Salovey's (1997) framework, originally for use in organisational contexts. Unlike the AES, WLEIS items formally comprise four factors: self-emotion appraisal, other-emotion appraisal, use of emotion and emotion regulation. While the authors intended the WLEIS to be empirically distinct from FFM traits,

correlations range from .37 to .52 (James, Bore, & Zito, 2012), and tend to show slightly stronger associations than the AES. Only one study that used the WLEIS was included in Martins et al.'s (2010) meta-analysis, with a reported correlation of .24 with mental health. WLEIS-scored TEI has also been associated with adaptive coping styles (Nizielski, Hallum, Schutz, & Lopes, 2013). We are unaware of any investigated associations between the WLEIS and reappraisal or suppression, though given their conceptual similarity, we expected associations akin to the AES.

TEIQue. In contrast to the AES and WLEIS, the trait emotional intelligence questionnaire (TEIQue; Petrides, 2009) was not solely based on ability models of EI but rather was derived from a broader analysis of the sampling domain of TEI from analysis of the EI literature (Petrides & Furnham, 2001), and the location of TEI in personality factor space, specifically at the lower levels of the personality hierarchy (Petrides, Pita, & Kokkinaki, 2007). While the TEIQue does include factors similar to the AES and WLEIS (emotional expression, perception and management), it also includes broader dispositions such as happiness, self-esteem, and stress management. Accordingly, correlations between FFM traits and the TEIQue are generally larger in magnitude than for the other two scales (correlations between the TEIQue and extraversion and neuroticism have been as strong as $r = .52$ and $-.67$ respectively; Siegling, Vesely, & Saklofske, 2013). Martins et al.'s (2010) meta-analysis reports an average correlation between the TEIQue and mental health as .53, stronger than both the AES and WLEIS. Associations with coping styles are also generally stronger than with the previous two scales (e.g., Petrides et al., 2007). Finally, a recent study found that TEIQue-measured TEI was positively and negatively correlated with reappraisal and suppression respectively, and that reappraisal explained the relationship between TEIQue scores and stress responses (Beath, Jones, & Fitness, 2014b; Chapter 3).

Aims of the Current Study

In summary, the current study set out to identify whether coping and ER can explain some or all of the association between TEI and psychological distress, but importantly, to test this individually for three TEI scales: the TEIQue, AES and WLEIS. Given that all three TEI scales correlate with the FFM, and given that these traits are associated with mental health in their own right (e.g., Hagger, 2009), it was considered important to include personality in the study. Thus, we proposed the model depicted in Figure 1. (Only adaptive coping is shown here for simplicity, but multiple coping styles were assessed.) Given that the AES and WLEIS are both based on the same theoretical model and have shown similar associations with distress and personality, we hypothesised that:

H1. All three TEI scales would be positively related to extraversion, agreeableness, conscientiousness, openness to experience and low neuroticism, with the strongest associations for the TEIQue, and weaker associations for the AES and WLEIS.

Given the associations between each TEI scale and mental health reported in Martins et al. (2010), we hypothesised that:

H2. Compared to the AES and WLEIS, the TEIQue would be more strongly associated with lower psychological distress.

Finally, given H2 and previous work that has specifically investigated the TEIQue, reappraisal, and psychological distress (Beath et al., 2014b; Chapter 3), we hypothesised that:

H3. Coping, reappraisal and suppression would explain the association between each TEI scale and distress, with reappraisal more directly featuring in the TEIQue model, as seen in Figure 1.

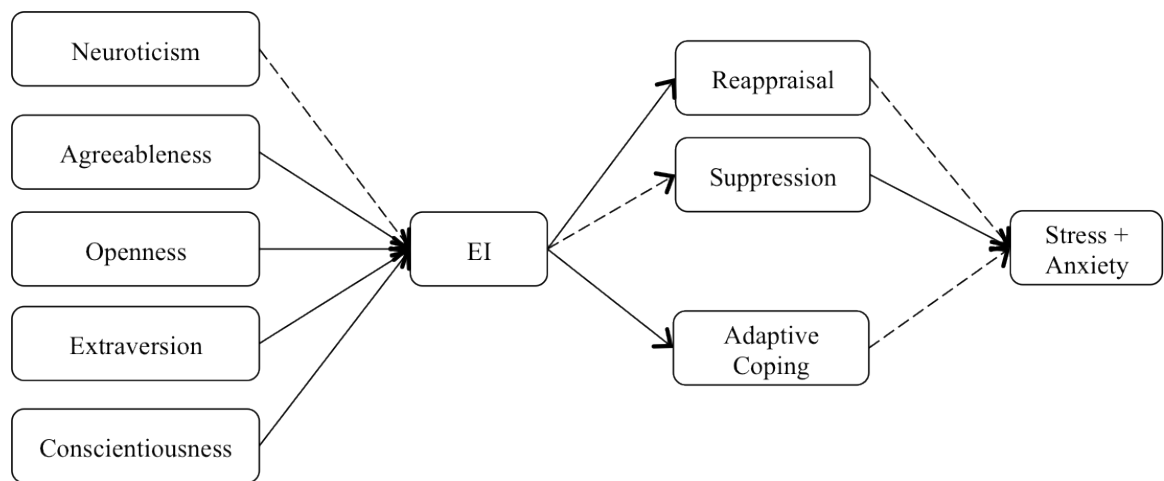


Figure 1. The hypothesised model. Long dashed lines represent negative hypothesised paths.

Method

Participants

Participants were recruited via Amazon's Mechanical Turk online marketplace (Mturk; <https://www.mturk.com/mturk/welcome>), where the study was advertised to potential participants who chose to complete the 45-minute survey in exchange for US\$1.00. Mturk has become an increasingly common source of online recruitment, and samples have been shown to be comparable to those recruited via other online methods (Mason & Suri, 2012) and a reliable source of participants for scientific research (Goodman, Cryder, & Cheema, 2013). There is no geographic restriction for individuals to participate in Mturk projects, so a prerequisite for participation in the current study was fluent English ability. 423 participants signed up to complete the survey online, ranging from 18 to 68 years of age ($M = 32.25$, $SD = 10.22$) (see Table 1). This demographic profile is generally consistent with other research using samples recruited through Mturk, though with a slightly lower proportion of Americans than some previous research has reported (e.g., Buhrmester, Kwang, & Gosling, 2011).

Table 1

Sample Demographics

Criteria	n (%)
Gender	
Male	235 (56)
Female	188 (44)
Location of Residence	
India	249 (59)
USA	154 (36)
Other	20 (5)
Nationality	
Indian	254 (60)
American	144 (34)
Other	25 (6)
Native Language	
English	270 (63)
Tamil	72 (17)
Other Indian	61 (14)
Other non-Indian	20 (5)
Highest Educational Attainment	
Bachelor's degree	205 (48)
Post-Graduate degree	93 (22)
Diploma	71 (17)
High school completion	42 (10)
Doctorate	7 (2)
Did not complete high school	5 (1)

Note. $N = 423$.

Measures

FFM. International Personality Item Pool items (Goldberg et al., 2006), based on the NEO-PI- R, 10 per factor, measured neuroticism (e.g., “I often feel blue”), extraversion (e.g., “I make friends easily”), agreeableness (e.g., “I make people feel at ease”), openness to experience (e.g., “I enjoy hearing new ideas”) and conscientiousness (e.g., “I make plans and stick to them”). Responses were rated on 5-point scales (*very inaccurate* to *very accurate*).

Coping. We utilised the Brief COPE (Carver, 1997) with 26 items forming 13 subscales (due to a technical issue, responses for the 14th subscale, self-blame, were not recorded). Instructions asked participants to respond according to what they generally do and feel when experiencing stressful or difficult events (see all items in Supplementary Material

Table 2.) While Carver reported satisfactory reliabilities for Brief COPE subscales, a number of subscales had lower than satisfactory reliabilities in the current study (i.e., acceptance Cronbach's $\alpha = .464$; self distraction $\alpha = .379$). Since this indicates that the nominal domain structure did not apply well in the current sample, we used a two-stage factor analysis strategy to adapt the Brief COPE to the current context (see Appendix D for full description of methods and results), which resulted in five coping factors with much improved scale reliabilities: avoidant ($\alpha = .853$), active ($\alpha = .792$), social ($\alpha = .773$), religious ($\alpha = .743$) and humour coping ($\alpha = .899$).

ER. The Emotion Regulation Questionnaire (Gross & John, 2003), a reliable and valid measure of how individuals typically regulate their emotions, was used to assess reappraisal (six items, e.g., “When I want to feel less negative emotion, I change the way I’m thinking about the situation”) and suppression (four items, e.g., “I control my emotions by not expressing them”). Responses were recorded on 7-point scales (*strongly disagree* to *strongly agree*).

TEI. Three TEI scales were used: first, a 41-item modified version of the AES (e.g., “Other people find it easy to confide in me”; Austin, Saklofske, Huang, & McKenney, 2004), which has stronger psychometric properties than the original, answered using 5-point response scales (*completely disagree* to *completely agree*); second, the 16-item WLEIS (e.g., “I am sensitive to the feelings and emotions of others”; Law et al., 2004), answered on 7-point response scales; and third, the 30-item TEIQue – short form (e.g., “On the whole, I’m able to deal with stress”; Petrides, 2009), answered on 7-point response scales. We used the short form of the TEIQue rather than the full 153-item scale to minimise the length of the survey.

Distress. Psychological distress was measured with the stress and anxiety subscales of the Depression, Anxiety and Stress Scale (DASS; Lovibond & Lovibond, 1995) using the

stress (assessing nonspecific nervous arousal; e.g. “I found myself getting upset by quite trivial things”) and anxiety (assessing specific physiological and affective arousal; e.g., “I was aware of the dryness of my mouth”) subscales. Each subscale comprised 14 items rated on 4-point scales (*did not apply to me at all* through to *applied to me very much, or most of the time*). Instructions asked participants to respond based on how they had been feeling during the previous week.

Table 2

Correlation Matrix

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. AES	.91																
2. WLEIS	.57	.94															
3. TEIQue	.83	.59	.92														
4. Neuroticism	-.57	-.52	-.77	.86													
5. Extraversion	.50	.49	.61	-.53	.84												
6. Agreeableness	.65	.46	.68	-.58	.46	.82											
7. Openness	.60	.25	.50	-.22	.32	.43	.80										
8. Conscientiousness	.64	.52	.76	-.63	.52	.56	.46	.85									
9. Reappraisal	.41	.65	.40	-.36	.30	.35	.29	.29	.85								
10. Suppression	-.39	.14	-.26	.12	-.09	-.23	-.16	-.12	.22	.79							
11. Avoid coping	-.59	.12	-.57	.41	-.16	-.42	-.42	-.55	.01	.38	.85						
12. Positive coping	.40	.62	.41	-.29	.35	.29	.29	.34	.59	.11	.20	.79					
13. Support coping	.11	.27	.03	-.02	.25	.12	-.06	-.07	.26	-.11	.39	.40	.77				
14. Humour coping	-.20	.05	-.17	-.05	-.02	-.18	-.20	-.25	.14	.10	.49	.22	.35	.90			
15. Religion coping	-.01	.27	.01	.03	.25	.07	-.12	.06	.17	.19	.25	.250	.26	.01	.74		
16. Stress	-.60	-.21	-.64	.53	-.26	-.54	-.42	-.56	-.13	.30	.75	-.03	.28	.34	.21	.95	
17. Anxiety	-.60	-.14	-.62	.48	-.18	-.52	-.45	-.53	-.09	.37	.78	.00	.27	.34	.28	.94	.96

Note. $N = 423$. Reliabilities (Cronbach's alphas) are on the diagonal with correlations on the lower triangle. $rs > |.100|$ are

statistically significant, $p < .05$.

Results

Correlations

Descriptive correlations are reported in Table 2. While significant positive correlations were found among all three TEI scales, stronger correlations were found between the TEIQue and AES than with the WLEIS, contrary to expectations. Similar patterns of correlations with other variables were found for each TEI scale, with a few exceptions. As expected, the TEIQue correlated more strongly than the other scales with personality. The TEIQue and AES correlated positively with reappraisal and negatively with suppression, but unexpectedly, the WLEIS correlated positively with suppression. Avoidant, social, humour and religious coping were all positively correlated with stress and anxiety, but unexpectedly, no associations were found between positive coping and stress and anxiety. Stress and anxiety showed similar correlations with the other variables and were highly inter-correlated; hence, a latent variable of ‘distress’ that combined these two measures was used in the SEMs.

SEMs

The study’s hypotheses were assessed via structural equation models (SEMs) that represented the hypothesised model (Figure 1) using Mplus v.7 (Muthén & Muthén, 1998-2012). All variables except the TEI scale were kept consistent across all SEMs. As the assumption of multivariate normality was violated by the data, standard errors were derived via the nonparametric bootstrap (2000 resamples). SEMs were fitted for each TEI scale and hypotheses were tested using model fit indices and path coefficients, plus comparisons of direct and indirect effects in the SEMs. Standardised path coefficients, 95% confidence intervals and model fit indices are reported for all SEMs. Initially, all coping factors were included in the models, but active coping was not significantly related to distress, and social and humour coping were not significantly related to any of the TEI scales. Hence, the

reported models include only avoidant and religious coping. See Tables 3 and 4 for details of model paths and model fit indices.

Table 3

Direct and Indirect Effects of AES, WLEIS and TEIQue on Psychological Distress

Effect	AES		WLEIS		TEIQue	
	β	CI	β	CI	β	CI
Total effect	-.604***	[-.665, -.552]	-.158**	[-.259, -.056]	-.640***	[-.699, -.581]
Direct effect	-.202***	[-.323, -.082]	-.039	[-.124, .062]	-.289***	[-.405, -.174]
Indirect effect						
Total	-.402***	[-.503, -.300]	-.119*	[-.218, -.019]	-.350***	[-.448, -.253]
Via AC	-.367***	[-.435, -.309]	-.082*	[-.153, -.011]	-.330***	[-.404, -.255]
Via RC	-.001	[-.014, .012]	.028*	[.005, .048]	.001	[-.013, .015]
Via reappraisal	-.020	[-.058, .018]	-.082*	[-.145, -.019]	-.009	[-.042, .023]
Via suppression	-.014	[-.048, .015]	.015	[.000, .030]	-.012	[-.034, .010]

Note. * $p < .05$ ** $p < .01$ *** $p < .001$. β = standardised path coefficient. CI = 95%

confidence interval. AC = avoidant coping. RC = religious coping.

Table 4

Model Fit Indices

Scale	$\chi^2(38)$	RMSEA	95% CI		CFI	SRMR
			LB	UB		
AES	369.429	.144	.130	.157	.871	.084
TEIQue	345.257	.140	.127	.154	.884	.080
WLEIS	569.853	.182	.169	.195	.778	.180

Note. χ^2 = Chi square statistic, RMSEA = Root mean square error of approximation, CI =

Confidence interval, LB = lower bound, UB = upper bound, CFI = Comparative fit index,

SRMR = Standardised root mean square residual.

AES (see Figure 2). The total effect of the AES on distress was strongly negative. The negative indirect path via avoidant coping explains most of this effect, although a small negative direct effect was also significant: Higher AES individuals experienced less distress, primarily due to using less avoidant coping. Indirect effects via reappraisal, suppression and religious coping were not significant. Model fit indices were lower than ideal. All FFM traits were statistically significant in the expected direction except for extraversion. This model explained 67% of the variance in distress.

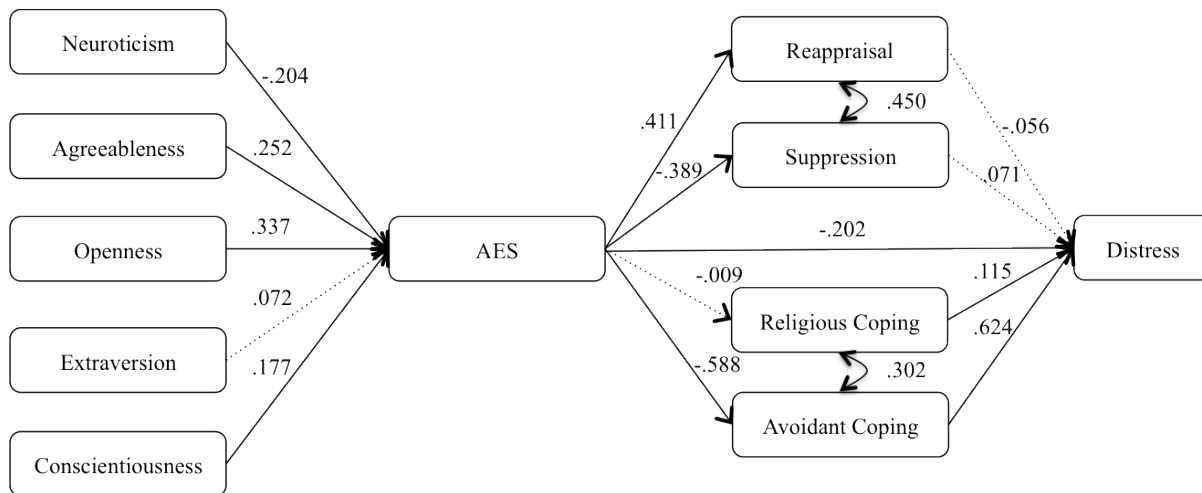


Figure 2. AES model including standardised coefficients. Dotted lines represent non-significant paths.

TEIQue (see Figure 3). The total, negative effect of the TEIQue on distress was slightly stronger than the AES, and was partitioned between the direct and indirect (via avoidant coping) effects. As with the AES, this shows that high TEIQue individuals experience less distress, partially due to less use of avoidant coping. Again, reappraisal, suppression and religious coping were not significant. Model fit indices were similar to the AES model. All personality paths were significant and in the expected direction. This model explained 69% of the variance in distress.

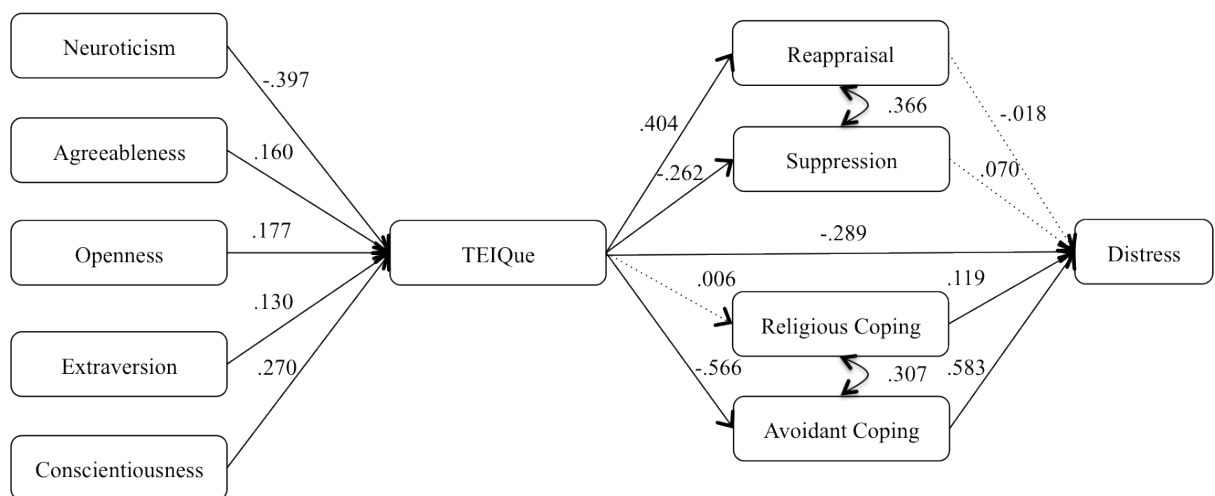


Figure 3. TEIQue model including standardised coefficients. Dotted lines represent non significant paths.

WLEIS (see Figure 4). The results for the WLEIS model differed in a number of respects from the previous two. The total effect on distress was substantially smaller, and the direct effect was not statistically significant. Indirect effects via reappraisal, avoidant and religious coping were statistically significant (although weak), and the effect via suppression was almost significant (though very weak). Surprisingly, the WLEIS had a positive indirect effect on distress via suppression and religious coping: Higher WLEIS individuals used more suppression and religious coping, and experienced greater psychological distress. However, the reappraisal path was negative: Higher WLEIS individuals used more reappraisal, which is

associated with lower distress. The direction of these effects could explain the small size of the overall WLEIS-distress effect, as the positive and negative effects cancelled each other out. All personality paths were in the expected direction and all were significant except openness. Model fit indices were less than satisfactory. This model explained 63% of the variance in distress.

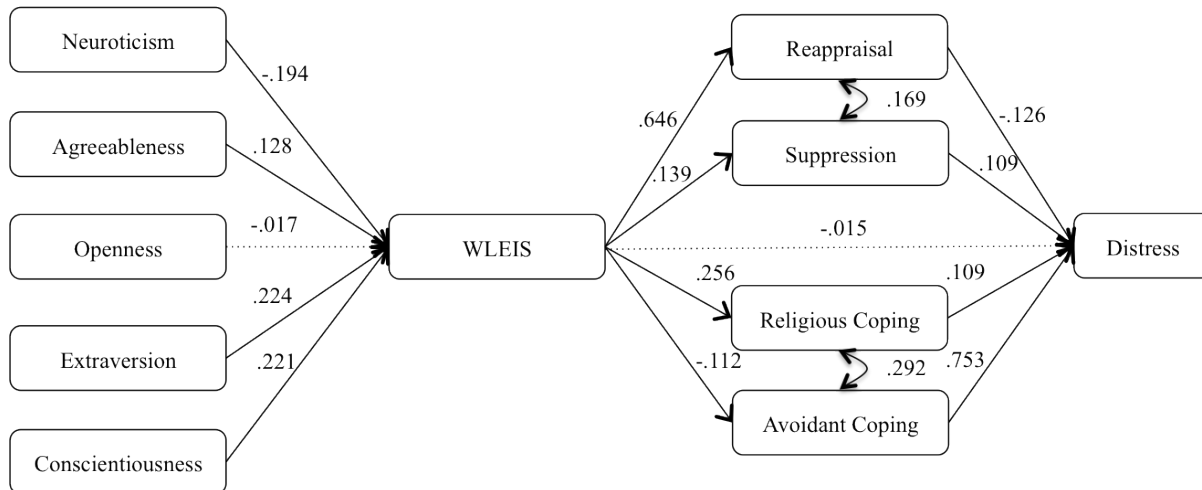


Figure 4. WLEIS model including standardised coefficients. Dotted lines represent non-significant paths.

Language differences. We assessed potential differences in model fit due to participants' native language (English or non-English) using Chi-square difference tests between the model where parameters were constrained between groups, and the model where parameters were free to vary (Milfont & Fischer, 2010). The tests for the AES and TEIQue were not statistically significant: AES $\chi^2(16) = 25.322, p = .064$; TEIQue $\chi^2(16) = 23.328, p = .105$, both against a critical $\chi^2(16)$ of 26.30 (Howell, 2009). The same test applied to the WLEIS test was statistically significant ($\chi^2(16) = 40.303, p < .001$). Given this, more specific tests for invariance of parameters across groups were performed using Stata v.13 (StataCorp, 2013), which reported if structural coefficients or measurement coefficients were significantly different across groups. Results demonstrated that the structural coefficients

varied (Wald $\chi^2(14) = 26.208, p = .024$). Finally, an investigation of which individual paths differed across groups (Sörbom, 1989) showed only two significant results: openness (Wald $\chi^2(1) = 9.108, p = .003$) and conscientiousness (Wald $\chi^2(1) = 7.571, p = .006$), which were significantly stronger in the non-English-speaking than the English-speaking group. Importantly, the lack of other significant results indicates that the TEI-distress relationships do not vary across different language groups.

Discussion

This study extended previous research by examining the extent to which coping and ER explain the TEI-distress association, across three different scales: the AES, WLEIS and TEIQue. The AES-distress association was mostly explained via reduced use of avoidant coping: Higher AES individuals used less avoidant coping, and experienced lower psychological distress. A small direct path from the AES to distress indicated that some of the AES effect was unaccounted for by coping. In contrast, the TEIQue demonstrated approximately equal indirect (via avoidant coping) and direct effects on distress, resulting in a slightly larger total effect. This direct TEIQue path is consistent with findings that under stress, high TEIQue individuals have lower cortisol response (Mikolajczak, Roy, Luminet, Fillee, & de Timary, 2007) and heart rate (Laborde, Brüll, Weber, & Anders, 2011). This suggests physiological stress-response differences between high and low TEIQue individuals that protect against stress and anxiety, regardless of coping styles and ER strategies. Perhaps this physiological mechanism is also captured by the AES, given that a significant (albeit smaller) direct effect was found. In fact, it is interesting that the TEIQue and AES results were so similar, given that Petrides and colleagues do not consider the AES to assess the complete TEI sampling domain that is measured by the TEIQue (Pérez, Petrides, & Furnham, 2005). Future research should investigate whether this finding was the result of using the modified AES (Austin et al., 2004).

WLEIS

Most research using the WLEIS has been in organisational settings (see Jordan, Murray, & Lawrence, 2009), which makes the present results particularly novel. WLEIS scores were associated with the greatest number of mechanisms: Higher WLEIS individuals experienced lower distress via less use of avoidant coping and greater use of reappraisal, though with weak effects. Unexpectedly, the WLEIS was also positively associated with distress through greater use of suppression and religious coping. While suppression tends to increase negative affect in the context of a stressor (Gross & John, 2003), the broader benefit or cost of emotion regulation (Aldao, 2013) and religious coping (Ano & Vasconcelles, 2005) has been shown to be context-dependent, depending on *how* each is utilised in any particular context. Perhaps high WLEIS individuals are more likely to use suppression and religious coping in some work-related situations with the aim of improving performance, even if the cost is greater stress and anxiety.

Strengths and Limitations

This study is novel in its comparison of effects among three different TEI scales, and its use of a demographically broader sample, giving greater external validity to the results compared to those typically obtained from more homogenous samples. While analyses of group differences showed that key associations did not differ between the native English speaking and non-English speaking participants, and research has shown that the prevalence of depression and general anxiety is similar in an Mturk sample compared to general population (Shapiro, Chandler, & Mueller, 2013), the results do need replication to see if they equally apply in other samples.

One limitation to this study, however, is its cross-sectional methodology. While the analyses and results suggest that coping and ER may have indirect effects on distress, a longitudinal study is needed to evaluate whether they mediate the relationship. Additionally,

the use of brief measures (TEIQue-SF and Brief COPE) was not ideal, as they provide less comprehensive measures of the constructs than the full versions. The choice of the brief versions was based on practicality, given the number of survey measures included and the large sample size needed. Future research should attempt to replicate the effects found here using full measures.

Implications and Conclusions

This study is the first of its kind to compare different measures of TEI and their relationships with psychological distress, and the results are enlightening. The AES results show that its association with psychological distress may primarily be a function of less avoidant coping. The TEIQue, too, was associated with avoidant coping, but in addition, was directly and negatively associated with psychological distress. This could reflect the assessment of a unique, physiological stress response. Finally, the WLEIS was associated with the greatest number of mechanisms, both adaptive (reappraisal and less avoidant coping) and maladaptive (suppression and religious coping). While it has been argued that the TEIQue is unique in its comprehensive assessment of the TEI domain compared to the AES and WLEIS (Pérez et al., 2005), we have shown that the TEIQue and AES are actually quite similar, and that the WLEIS is divergent in its associations with a greater number of mechanisms. These results show that coping, and to a lesser extent reappraisal and suppression, are important factors in explaining how TEI predicts less psychological distress, but the extent of that importance differs by TEI scale. Researchers should use the results of this study to guide selection of TEI scales in future research on the heterogeneity of TEI.

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Chapter 5: An Exploration of Types of Cognitive Reappraisal

The work reported in the previous two chapters has demonstrated that cognitive reappraisal plays an important role in the association between TEI and psychological health. Chapter 4 showed that the higher an individual's TEI, the more reappraisal they report using, and the less stress and anxiety they report experiencing; and additionally that reappraisal significantly explained part of the TEI – distress association for one particular TEI scale, the WLEIS. Chapter 3 showed that in the midst of a long-term stressor, high TEI individuals (as measured by the TEIQue) use more reappraisal, which actually increased their stress temporarily, while their anxiety remained low. This research suggests that, compared with low TEI individuals, high TEI individuals might use reappraisal in order to engage more directly with the demands of the task at hand, which has the shorter-term effect of raising their stress levels, but which is more beneficial long-term.

Given that the research presented in these previous chapters has demonstrated the importance of reappraisal when considering the relationship between TEI and psychological well-being, I decided it would be useful for this thesis to investigate the construct of reappraisal in more detail. Specifically, I wished to better understand the different ways that individuals use reappraisal, and what contextual factors make some types of reappraisal more or less appropriate. As will be demonstrated in the paper to follow, while there have been previous attempts to categorise types of reappraisal (e.g., McRae, Ciesielski, & Gross, 2012; Shiota & Levenson, 2012), what was missing in both of these attempts was a theoretically coherent framework to unify these approaches. Furthermore, I wanted to be able to tease apart the relationship between TEI and reappraisal in the final study presented here (Chapter 6), and in order to do so, I needed to explore different types of reappraisal; in doing so, this addressed Aim 4 of the thesis.

I was the major contributor to this co-authored paper. I conceived of the study myself, with input from Michael Jones and Julie Fitness. I collected the data and conducted the

analyses. I drafted the first version of the manuscript, and both Michael Jones and Julie Fitness provided feedback and suggestions on multiple versions of the manuscript. Christine Leonards provided help with data coding when dual coding was needed.

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Control and Certainty Matter: A Conceptual and Empirical Analysis of Types of Cognitive
Reappraisal

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Abstract

Research has demonstrated the benefit of cognitive reappraisal for regulating negative emotions but to date no work has investigated specific types of reappraisal in externally-valid, everyday scenarios. We present a conceptual review of the literature and propose a theoretically based, novel categorisation of reappraisal *intent*, situation- versus goal-focused reappraisal, which provides a framework within which to integrate existing types of reappraisal *content*. We used three vignettes as stimuli: an upcoming university assessment, potential relationship breakdown, and work scheduling issue, which were shown to vary on dimensions of controllability of the outcome and certainty of the future occurrence in Study 1 ($N = 51$). Study 2 ($N = 226$) demonstrated that the type of reappraisal significantly differed across the three vignettes, in line with hypotheses. A model is presented to demonstrate that use of reappraisal differs by (a) an evaluation of the worthiness of the goal held, (b) the certainty of the event occurring and (c) the controllability of the outcome.

Keywords: cognitive reappraisal; emotion regulation; affect; appraisal

Control and Certainty Matter: A Conceptual and Qualitative Analysis of Types of Cognitive Reappraisal

Cognitive reappraisal is one of the most widely researched emotion regulation strategies, and is engaged by changing the interpretation of an emotion-eliciting situation so as to change the experienced affect (Gross, 1998). While experimental research has demonstrated the usefulness of reappraisal in decreasing the affective and physiological experiences of negative emotions (e.g. Gross, 2002), the explicit reappraisal instructions given to participants in laboratory-based experimental settings are usually non-specific (e.g., “think about the picture in a way that decreases your negative affect”; Ray, McRae, Ochsner, & Gross, 2010, p. 588). Although this kind of research demonstrates that reappraisal is effective, it does not elucidate the ways in which participants interpret and implement such global reappraisal instructions. Recently, researchers have begun to investigate potential categories, or sub-types of reappraisal (McRae, Ciesielski, & Gross, 2012; Shiota & Levenson, 2012); however, further work is needed to integrate these categories into a theoretically coherent model. Further, there is a need for research that explores individuals’ reappraisal strategies in more everyday, and thus externally valid, contexts. Accordingly, our aims in the current paper are, first, to review existing categorisation systems of reappraisal and to propose a more thorough, though complementary, framework; second, to demonstrate how these categorization systems may be integrated to provide a richer model of the conditions under which people may be more or less likely to use different types of reappraisal; and third, to validate the use of these types of reappraisal within everyday contexts.

Types of Reappraisal

Self versus situation focus. To our knowledge, the first reappraisal categorisation system was proposed by Ochsner et al. (2004), who suggested that reappraisal could be

engaged in one of two ways: by focusing on (1) the self-relevance of the event (also called distancing from the stimulus), or (2) situational aspects of the event (also called reinterpreting the event). Reappraisal of the self-relevance of the event to down-regulate a negative emotion requires individuals to increase the metaphoric distance between themselves and the event that is occurring, seeing the stimulus “from a detached, third-person...clinical perspective of one not personally connected in any way” (Ochsner et al., 2004, pp. 484-5). Denson, Grisham, and Moulds (2011) asked participants to “think about [the stimulus] objectively and analytically, rather than as personally, or in any way emotionally relevant to you” (p. 17). Secondly, instructions to reinterpret situational aspects of an event include thinking differently about “the emotions, actions, and outcomes of individuals as depicted in their situational context” (Ochsner et al., 2004, p. 485). For example, “an image of a woman crying in a church may initially be interpreted as an expression of mourning at a funeral ...[but] could be reinterpreted as depicting a woman crying tears of joy at a wedding” (Bebko, Franconeri, Ochsner, & Chiao, 2011, p. 734). Recently, Shiota and Levenson (2012) updated this dichotomy by making a similar distinction between detached reappraisal (decreasing all felt emotion via focusing on feeling detached and separate from the emotion-eliciting event) and positive reappraisal (finding something positive in the situation to focus on).

While this self- versus situation-focus dichotomy may be useful when considering reappraisals of experimental stimuli, we argue that reappraising the self-relevance of the event via detached reappraisal is often not relevant or even feasible in real-life, personal situations, such as a relationship breakdown or death of a family member, as these experiences are inherently self-relevant. Indeed, as noted by early cognitive appraisal theorists (e.g., Lazarus, 1991), the experience of emotion requires primary appraisals of a stimulus in terms of its valence (good or bad) and its self-relevance (does it matter to me?). We will next review an alternate way of categorising reappraisals that focuses on sub-types,

and which was proposed independently to Shiota and Levenson's system. We will then present a novel, complementary dichotomy as a framework within which to locate existing categorisation systems (including sub-types).

Reappraisal tactics. McRae and colleagues (2012) proposed that there are eight types of reappraisal content, denoted as tactics (see Table 1).

Table 1

Reappraisal tactics developed by McRae et al. (2012).

Reappraisal tactic	Description
Explicitly positive	The protagonist is definitively better off for this event happening
Change current circumstances	The event is not as bad as it could be
Reality challenge	The event is not real, it is fake
Change future consequences	The event might be bad now for the protagonist, but will get better in the future
Agency	The protagonist has the skills to deal with or change this event
Distancing	The event does not involve the individual
Problem solving (planning)	The protagonist should make a plan to solve or change the event
Acceptance	There is nothing that can be done, it is not that important in the scheme of things

These tactics were derived from McRae and colleagues' review of the literature, and were validated in an experimental study using participants' self-reported descriptions of their personal use of reappraisal after viewing negative affect-inducing pictures. Participants were instructed to reappraise the pictures in one of two ways: either to increase their positive feelings or to decrease their negative feelings in relation to the picture. Specific instructions told participants to "tell yourself something about what's going on in the photo so that that you feel as positively as you can ([or, in the alternate condition] *less negatively*) ... change the meaning of the emotional event so that you feel as strongly positive (*minimally negative*) as you can." (McRae et al., 2012, p. 251; text in square brackets added). Of these eight tactics, two are dissimilar to the other six, in that they encourage action from the protagonist

to actively engage with the situation. Agency and problem solving encourage the protagonist to engage with a specific plan of action, whereas the other six tactics involve passive reappraisal without the need for any specific action on behalf of the protagonist following the reappraisal.

These reappraisal tactics build on the earlier, more global reappraisal model proposed by Ochsner et al. (2004) and Shiota and Levenson (2012). Specifically, one aspect of that earlier dichotomy involved altering the appraisal of personal significance, which could be achieved using the tactics of distancing, reality challenge and possibly acceptance. The second aspect involved reinterpreting situational aspects of the event (via positive features for the Shiota and Levenson dichotomy), which can be achieved by changing the current or future circumstances, or the explicitly positive tactic. In this way, it is possible to categorise the reappraisal tactics neatly within the earlier dichotomous scheme. However, we would argue that this more comprehensive model of reappraisal tactics still has some limitations. In particular, some reappraisal subtypes (e.g., distancing, reality challenge) might not be relevant for everyday, personally significant events. Further, this model focuses on the *content* of reappraisals. We would argue that an alternate, complementary, dichotomy may be more applicable to everyday, emotion-inducing situations, and can work as a framework for integrating these prior classifications. Specifically, we propose that reappraisals can be classified not only according to their content, but also according to their *intent*. We elaborate on this distinction below.

Situation as relevant to a goal. Put simply, emotions are elicited in response to evaluations of a proximate situation or context in light of an individual's goals; an undesired mismatch between the present situation and the wider goal gives rise to negative emotions (Barrett, Mesquita, Ochsner, & Gross, 2007; Higgins, 1987; Shaver, Schwartz, Kirson, & O'Connor, 1987). Given that reappraisal involves changing the emotion by changing the

individual's appraisal, or interpretation, of the situation, there are two potential areas upon which to focus the reappraisal: altering how the immediate situation might threaten or undermine the wider goal, or altering the importance or interpretation of the goal itself. The evaluation of the goal-relevance of the present situation is thought to be one of the earliest evaluations made in the appraisal process (see Scherer, 2013, for a discussion of temporal processes of appraisal dimensions).

For example, Jane may be feeling upset and anxious about an upcoming job interview, because she desires this new job. Her thought that she might not do well is the immediate situation, which is incongruent with her goal to get the new job, and so she experiences anxiety. In this instance, Jane might reappraise the situation in one of two ways: she might change her interpretation of the situation so that it is no longer incongruent with her goal, or she might change her goal. For example, Jane could think that she has always gone well in previous job interviews, she knows she is well prepared, she is personable, and so on. In doing this, Jane's goal of getting the new job is intact, but she alters her appraisal of the immediate situation so that it is no longer incongruent with her goal. Alternatively, Jane might tell herself if she is not awarded the new job there are many other job opportunities elsewhere, including potentially more suitable ones. By doing this, the situation (potentially not doing well) is still relevant for the original goal (getting this job), but the goal is no longer so important. While both types of reappraisal alter her interpretation of the emotion-inducing present circumstance, they do so by focusing on different parts of the situation-goal setting.

Integrating reappraisal techniques

While classifying reappraisal attempts into focusing on the situation or the goal is pragmatically different to the reappraisal sub-types model, in fact these two classification systems are not incongruent. Each of the eight subtypes, or reappraisal tactics, proposed by McCrae et al. (2012) could potentially be applied by reinterpreting either situational

relevance *or* goal, because they are focused on different aspects of the reappraisal (reappraisal *content*) to the situation-goal categories (reappraisal *intent*). For instance, John is upset because his mother has been diagnosed with cancer (situation), and he is highly anxious about losing her to the disease (his goal being to preserve her life). John could use situation-focused reappraisal by changing future consequences (while it is upsetting, the diagnosis will lead to treatment intervention which will improve her chances of recovery) or planning (there are many types of treatment available, one in particular has the highest rates of remission, he should make sure his mother receives that treatment). He could also apply goal-focused reappraisal through acceptance (if she does pass away, there is nothing he can do about it, death is an inevitable part of life) or by changing future consequences (he will experience severe grief initially, but he believes that he will adjust over time). Therefore, we expect that each of the eight reappraisal tactics can be used by either reappraising the situation or the goal; that is, the reappraisal tactics will be nested within each of the two reappraisal categories.

In any emotion-inducing situation, then, there is hypothetically the option of reappraising either the situation or the goal. What might make one more appropriate than the other, though, is likely to depend on aspects of the situation itself. For example, if the situation is sufficiently ambiguous to allow for multiple interpretations (e.g., Jane is waiting for a job interview), we argue that individuals will be more likely to employ situation-focused than goal-focused reappraisal. This is because situational reappraisal would be less cognitively taxing than altering a self-relevant important goal, given the pervasive nature of goals and their importance in motivating behaviour (Austin & Vancouver, 1996). However, if a situation is unambiguous and realistically difficult to reappraise in the face of reality, we argue that goal-focused reappraisal will be more likely.

Similarly, we speculate whether some situations might naturally lend themselves to the use of particular tactics. For example, there must be something beneficial in a situation to enable the use of the ‘explicitly positive’ tactic; a situation must be somewhat controllable to enable the use of the two active tactics, agency and problem solving, or else engaging in active effort would be pointless for the protagonist. This parallels a distinction made in the coping literature, where the controllability of the situation is seen to dictate the use of practical coping styles, and more acceptance-based coping styles are used for uncontrollable situations (Park, Armeli, & Tennen, 2004). Thus, we argue that the more controllable a situation is, the more appropriate active tactics would be; the less controllable, the more appropriate passive tactics would be.

The current study. In the current study we aimed to examine the use of each reappraisal tactic in a variety of everyday situations, to see if the features of the event itself dictated differential use of tactics. We aimed to validate both classification systems (goal vs. situation focus, and reappraisal tactics) in realistic, everyday scenarios, to assess whether features of the event impacted on how individuals used reappraisal. We utilised a therapist-client paradigm, asking participants to give reappraisal advice to a hypothetical client, using three independent scenarios (an upcoming university assessment, a relationship issue and a work problem). We aimed to investigate how participants interpreted these three scenarios, and whether the kind of reappraisal used differed as a function of that interpretation. Thus, in Study 1, we pilot tested the vignettes, and in Study 2 we investigated the use of reappraisal across the three scenarios, testing specific hypotheses that were generated as a result of the findings of Study 1.

STUDY 1

As described above, we argue that individuals’ use of reappraisal categories (situation- or goal-focused) will depend on the ambiguity of the situation. Similarly, we argue

that use of tactics will depend on the amount of control the individual has over the situation. Given this, Study 1 pilot tested the vignettes to be used in Study 2, to check that they differed on ratings of certainty (how likely the uncertain outcome is to eventuate, and thus unambiguous the situation is) and control (how much control the protagonist has over the outcome).

Method

Participants

51 first-year undergraduate psychology students (39 females) completed the study at a metropolitan Sydney university for course credit. Informed consent was obtained from all participants involved in the study. Participants ranged from 18 to 39 years of age ($M = 19.84$, $SD = 2.74$), and most identified as Caucasian Australian (61%), followed by Asian-Pacific (22%), European (12%) and Middle-Eastern (6%) ethnicity.

Vignettes

Three specific scenarios were used: i) anxiety about an upcoming university assessment, ii) distress over a recent fight and potential break-up with a romantic partner, and iii) difficulty balancing university studies with outside employment. Inherent to each scenario was an assumption that Alex, the client, made: i) In the university scenario, he is likely to fail the assessment; ii) in the relationship scenario, he has broken up with his partner; iii) in the work scenario, he cannot successfully balance work and university. Each scenario also contained an affective evaluation about that assumption, which related to Alex's higher-order goals (failing would be bad, because he wants to do well to be able to work in his parents' business; Alex would be devastated without his partner, because he loves her very much and wanted a future with her; giving up either work or university would hinder his future employment prospects). The ambiguity of these scenarios was intentional: Alex was

distressed because an undesired event was likely to occur in the future, but had not occurred yet. (See Appendix E for the complete vignettes.)

Procedure

The survey consisted of demographic questions and the three vignettes as described above, the order of which was counterbalanced across participants, featuring either a male or female protagonist (gender was held constant across the three vignettes for each participant). These three scenarios were chosen as being relevant to undergraduate university students, based on pilot testing, while also being representative of a range of contexts. Following each vignette, participants were asked to complete the fear, hostility, guilt, sadness and serenity subscales of the PANAS-X (Watson & Clark, 1994), based on how they thought the protagonist, Alex, would be feeling in response to the vignette they just read. They were then asked how likely they thought it was that the outcome would occur (to measure certainty, on an 11-point scale, 0 = *definitely will not occur*, 10 = *definitely will occur*) and how much control the protagonist, Alex, had over the situation (0 = *no control*, 10 = *complete control*).

Results and Discussion

We initially tested to see if there were any differences in ratings of certainty, control and emotion according to the gender of the protagonist via both simple between-groups effects and gender by condition interactions. None were statistically significant (see Appendix E Table 1), and thus the following results are pooled across gender.

Table 2

Scenario ratings.

Factor	Range	<i>M (SD)</i>			<i>F</i> (2,106)
		University	Relationship	Work	
Control	0-10	7.76 (1.94) ^a	4.46 (2.04) ^b	5.48 (2.41) ^c	43.710***
Likely	0-10	4.80 (1.69) ^a	5.93 (2.11) ^b	4.83 (1.92) ^a	5.083**
Fear	1-5	3.77 (.90) ^a	3.20 (.81) ^b	2.93 (.89) ^c	31.486***
Hostile	1-5	2.56 (.96) ^a	3.25 (.92) ^b	3.75 (.80) ^c	43.923***
Guilt	1-5	2.89 (1.10) ^a	3.09 (1.12) ^a	1.96 (.94) ^b	31.260***
Sad	1-5	2.91 (.90) ^a	4.24 (.77) ^b	2.81 (.82) ^a	107.332***
Serene	1-5	1.17 (.40) ^a	1.12 (.28) ^{ab}	1.25 (.42) ^b	3.359*

Note. *M* = mean, *SD* = standard deviation. Conditions with different superscripts within each row differ significantly at $p < .017$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Differences in ratings of certainty, control and the five emotional states were analysed using repeated measures general linear models (GLMs). Significant overall effects of condition were followed up with pairwise contrast testing (using a Bonferroni correction to the critical alpha to control the experiment-wise type 1 error rate at 0.05, by adopting a test-wise error rate of $p \leq .017$). Results demonstrated that different emotions were dominant in each scenario, as seen in Table 2. Sadness was highest in the relationship scenario, fear was highest in the university scenario and hostility was highest in the work scenario. There were also significant differences in ratings of certainty and control (see Table 2). The relationship break-up was rated as more certain to eventuate than either the university and work conditions (with no significant difference between the two). Alex was deemed to have the greatest control in the university condition, followed by the work condition, and least control in the relationship condition.

We wished to investigate whether use of reappraisal would depend on how certain the outcome seemed, and how much control the protagonist had over the outcome. Hence, by demonstrating that these three scenarios differed in relation to certainty and control in Study

1, we were able to propose specific hypotheses, to be tested in Study 2, about how individuals would use reappraisal differently across the three scenarios.

STUDY 2

Study 1 showed that participants interpreted the three scenarios differently, in terms of the ambiguity of the outcome and the protagonist's control. In line with our theoretical model of situation- versus goal-focused reappraisal, we expected that when the likelihood of an undesired outcome appeared uncertain, the ambiguity of the situation would result in participants using situation-focused reappraisal (for example, in the university scenario described earlier, Alex still has time to work hard for his upcoming assessment, and with enough study he can surely pass). Conversely, if the undesired outcome appeared fairly certain to occur, the situation was unambiguous and thus we expected that participants would engage in goal-focused reappraisal (for example, assuming he does fail his assessment, Alex could be advised that there are many other ways of achieving success in his chosen career other than a university degree).

With respect to specific reappraisal tactics, we expected that perceptions of the situation's controllability would impact participants' choice of reappraisal tactic. Specifically, if the situation was viewed as controllable, we predicted there would be greater use of active tactics, such as agency or problem solving, since participants should recognise the opportunity for the protagonist to intervene in order to potentially change the outcome. Alternatively, if circumstances were viewed as uncontrollable, we predicted greater use of passive tactics (such as acceptance or changing the current circumstances) since participants would recognize the lack of opportunity for the protagonist to actively intervene to change the outcome of the situation.

In summary, for Study 2 we predicted the following: first, that situation-focused reappraisal would be more commonly used when the undesired outcome was uncertain (the

work and university scenarios), whereas goal-focused reappraisal would be more commonly used when the outcome was more certain (the relationship scenario) (Hypothesis 1). We also predicted that reappraisal tactics utilising passive engagement would be more commonly used when the protagonist had less control over the outcome (relationship and work scenarios), whereas tactics using active engagement would be more commonly used when the protagonist was perceived to have greater control over the outcome (university scenario) (Hypothesis 2). Finally, we predicted that the tactics of reality challenge and distancing would not be used in any scenario (Hypothesis 3).

Method

Participants

226 participants (46 males, 171 females; 9 participants did not report gender) completed the study in a third-year undergraduate social psychology course at a metropolitan Sydney university. Informed consent was obtained from all participants included in the study. Participants ranged from 19 to 50 years of age ($M = 22.49$, $SD = 4.11$ years; one female participant did not report her age). The majority of students were majoring in psychology (73%), followed by business and economics (17%), arts (5%), human sciences (3%) and science (2%) (3 students did not report their degree). Most students identified as being of Caucasian Australian ethnicity (69%), followed by Asian-Pacific (18%), European (5%), Middle Eastern (4%), South American (1%) and North American (<1%) (5 students did not report their ethnicity).

Procedure

Rather than asking about participants' personal experiences of reappraisal through retrospective reports, we utilised a therapist-client paradigm, where participants were asked to pretend to be therapists and give written advice, specifically using reappraisal, after reading a vignette of a client (named Alex) whom they were to imagine had presented to them with one

of three specific problems. Giving participants pre-specified problems allowed us to control the severity of the emotion-inducing situation while at the same time maximizing the reality of the context and thus the reality of the reappraisal task. It also enabled us to directly manipulate situational features in order to test our hypotheses, as was established in Study 1.

Participants were asked to pretend they were therapists giving advice to a client, Alex, specifically using cognitive reappraisal in order to try to make Alex think differently about the situation, to reduce his distress. While research into reappraisal has explored both up-regulation and down-regulation of both positive and negative emotions (see Ochsner & Gross, 2008, for a review), for simplicity, the scenarios in the current study all required down-regulation of negative emotions (see complete instructions in Appendix E). Participants completed the exercise individually in classes, and all classes had the process of cognitive reappraisal thoroughly explained to them, using multiple examples, before completing the exercise.

Three scenarios were used, consistent with those tested in Study 1: university condition ($n = 79$), relationship condition ($n = 73$) or work condition ($n = 74$). In all scenarios, the client, Alex, was described as a 20-year-old university student and either male ($n = 112$) or female ($n = 114$) depending on the condition (participants were randomly allocated to one of six [two genders x three scenarios] conditions).

Analyses

Qualitative analyses. Two independent raters coded each response. A discussion of what constituted examples of each category and tactic using 10 responses from each of the three scenarios (13% of total data) occurred initially, followed by independent parallel coding of the remaining 196 responses. For each response, data were coded according to the eight tactics and the two higher-order categories, situation- or goal-focus, and participants could use multiple tactics and/or categories within a response.

Cohen's kappa statistics (κ) were computed for inter-rater agreement (Cohen, 1960). Agreement was very high for reappraisal classified as situation-focused ($\kappa = .982$) and goal-focused ($\kappa = .951$). Agreement on situation-focused tactics ranged from $\kappa = .734$ (planning) to $\kappa = .922$ (explicitly positive). Goal-focused agency and acceptance were less than desirable, $\kappa = .590$ and $.544$ respectively, but this reflected the very small numbers of participants who used these tactics (see Table 4 below), and thus a small number of discrepancies was influential to the agreement statistic. The other goal-focused tactics were acceptable, ranging from $\kappa = .699$ (future) to $\kappa = .851$ (current circumstances). All discrepancies between raters were discussed, and final coding was agreed upon. All except two participants used cognitive reappraisal in some form, and all further data are presented excluding those two (final sample $N = 224$).

As mentioned earlier, inherent to each scenario was an initial assumption that Alex made, and an affective evaluation about that assumption that related back to Alex's higher-order goal. Situation-focused reappraisal advice targeted these initial assumptions (you will not fail the exam; you have not broken up with your partner; you can balance both work and university), while goal-focused reappraisal advice targeted the affective evaluation (even if you do fail, that is alright; even if you are broken up, that is alright; even if you do not balance both work and study, that is alright).

Quantitative analyses. After the coding was finalized, quantitative analyses were undertaken to see whether the frequency of use of each category and tactic differed according to study condition, Alex's gender, or participant demographics, using Chi-square tests of independence. All quantitative analyses were undertaken with SPSS (v. 20). Effect size measures for nominal associations were produced using Cramer's phi, ϕ (Howell, 2009). When assessing differences between the three study conditions, if any overall Chi-square tests were statistically significant, we performed follow-up tests on pairwise differences, using a Bonferroni correction to the critical alpha (significant at $p \leq .017$ to maintain an

experiment-wise error rate of 0.05, two-tailed). Within each study condition, we investigated whether use of the tactics varied according to the category (i.e., if some tactics were more likely to be utilized with goal-focused reappraisal, and others more likely with situation-focused reappraisal), using a mixed model analysis via the generalized estimating equations procedure (Ballinger, 2004), specifically testing an interaction between tactic and category. Finally, we assessed co-occurrences of tactics, to see if any tactics were more likely to be used with others, and whether this varied by study condition.

Results

Participants' responses ranged from 11 to 365 words in length ($M = 149.4$ words, $SD = 62.05$), and even the shortest response contained reappraisal content. Length of response did not differ by condition, Alex's gender, or participant demographics (largest $F = 1.446$, smallest $p = .209$). The distinction between situation- and goal-focused reappraisal was confirmed in participants' responses, as was the presence of most, but not all, tactics: As predicted in Hypothesis 3, reality challenge and distancing did not feature in any participants' responses. Of the remaining six tactics, 70% of participants used more than one (number of tactics used ranged from 1 to 5; $M = 2.11$, $SD = 0.99$); this did not differ by condition, Alex's gender or any participant demographics (largest $F = 2.525$, smallest $p = .082$). While we designed six conditions for the study (2 genders x 3 scenarios), there were very few differences found in reappraisal content according to the gender of the protagonist. These differences will be discussed in a latter section of the results, but for the most part data were collapsed across gender, and only differences across scenarios are reported.

Tactics and Categories

Within each of the three conditions, there was a clear distinction between reappraisal advice that focused on the situation compared to the goal, and across the six tactics. Examples are given below.

Differences among scenarios. Across all three scenarios, situation-focused reappraisal was most commonly used, followed by both situation- and goal-focused reappraisal, followed by goal-focused only. However, there was a significant difference in the use of goal- versus situation-focus across scenarios: In the work scenario, participants mainly used situation-focused reappraisal; in the relationship scenario, they mainly used goal-focused reappraisal; and in the university scenario, there was a more even spread; $\chi^2(4) = 91.623, p < .001, \phi = .640$. Percentages are reported in Table 3 below. This partially supported Hypothesis 1.

Table 3

Use of goal- or situation-focused reappraisal across the three scenarios.

Type of Reappraisal	% (n)			
	University	Relationship	Work	Total
Solely goal-focused	19 (15) ^a	56 (40) ^b	1 (1) ^c	25 (56)
Solely situation-focused	39 (31) ^a	15 (11) ^b	84 (64) ^c	46 (103)
Both goal and situation-focused	42 (33) ^a	29 (21) ^b	15 (11) ^c	29 (65)

Note. Data in cells are column percentages (with counts in parentheses) of responses in each condition where each type of reappraisal was used. Conditions with different superscripts within each row differ significantly, $p < .017$.

Our theoretical model argued that goal-focused reappraisal would be used when participants perceived a more certain outcome. However, unexpectedly, a proportion of reappraisals that focused on the goal did so *without* explicitly or implicitly stating that the outcome would eventuate. For example, in the university condition, a number of participants said that regardless of whether Alex fails or passes the assessment, she should think differently about her wider goal. We named this outcome-independent goal-focused reappraisal, and its use varied significantly between conditions, $\chi^2(4) = 24.681, p < .001$. In the university condition, 73% of participants who recommended goal-focused reappraisal

either partially or solely gave outcome-independent advice (e.g., “no matter what happens, know that your result in this exam will not change the kind of person you are...you will have a new experience to draw on as you move forward into your professional career”), compared to 58% of the work condition participants (for example, “the main thing here is for you to be positive no matter the outcome, these things happen, but you can change your perspective and...lessen your frustration with your predicament”), and 28% of those in the relationship condition (“whether meeting someone new or if you [and your present partner] do get together again – stop dwelling on the negatives and see this as an open door – new opportunities”, text in square brackets added).

The number of people who used each of the tactics and categories in their responses within each scenario can be seen in Table 4 below. Because each response could contain multiple tactics and categories, these numbers are not mutually exclusive, and numbers in each cell within each scenario sum to more than the total number of people in that scenario. Table 4 also contains results of the Chi-square tests, which show that the proportion of participants who used most of the tactics and both categories was significantly different across scenarios. Hypothesis 2, which predicted that active tactics would be more commonly used in the university scenario while passive tactics would be more common in the relationship and work scenarios, was supported.

Table 4

Use of categories and tactics across the three scenarios.

Tactic (<i>n</i>)	% (<i>n</i>)			$\chi^2(2)$	ϕ
	University	Relationship	Work		
Situation-Focused					
Active tactics					
Positive (14)	5 (36)	5 (36)	4 (29)	0.134	.024
Current (97)	17 (17) ^a	29 (30) ^b	51 (53) ^c	36.513**	.404
Future (39)	83(8) ^a	5 (13) ^a	31 (79) ^b	47.536**	.461
Acceptance (10)	2 (20) ^a	1 (10) ^a	7 (70) ^a	6.784*	.174
Passive tactics					
Agency (70)	46 (66) ^a	10 (14) ^b	14 (20) ^b	41.815**	.432
Planning (52)	29 (56) ^a	8 (15) ^b	15 (29) ^{ab}	14.279**	.252
Total (168)	64 (38) ^a	32 (19) ^b	72 (43) ^c	70.278**	.560
Goal-Focused					
Passive tactics					
Positive (40)	1 (2) ^a	38 (95) ^b	1 (2) ^a	99.211**	.628
Current (57)	27 (47) ^a	28 (49) ^a	2 (4) ^b	29.872**	.365
Future (62)	31 (50) ^a	22 (35) ^a	9 (15) ^b	14.166**	.251
Acceptance (21)	13 (62) ^a	6 (29) ^{ab}	2 (9) ^b	8.537*	.195
Active tactics					
Agency (4)	2 (50)	0	2 (50)	1.939	.093
Planning (9)	5 (55)	1 (11)	3 (33)	2.386	.103
Total (121)	48 (40) ^a	61 (50) ^b	12 (10) ^c	59.115**	.514

Note. Data in cells are row percentages, with counts following in parentheses. * $p < .05$.

** $p \leq .001$. Conditions with different superscripts within each row differ significantly,

$p < .017$. ϕ = Cramer's phi effect size.

University scenario. Situation-focused reappraisal challenged the anxiety around Alex failing the upcoming assessment, by using one or more of the six tactics seen in Table 4 above. Current situation-focused reappraisal included thinking of the upcoming assessment as an opportunity to do well, as opposed to the possibility of failure (“this assessment is your chance to bring up your overall mark!”); agency included focusing on Alex’s history of doing well in assessments, thus the likelihood of his doing well on this particular one (“[Alex] has never failed before”); and practical skills included mentioning specific tasks to aid in completing the assessment well (“take it in small steps, plan out short-term goals to keep

yourself organised”). Goal-focused reappraisal in this scenario centred around why Alex felt anxious about not doing well: either engaged with the possibility of failing (for example, with future-oriented reappraisal, “a failed unit is not the end of the world – he can always go on to repeat the unit and complete his degree”) or reinterpreting the pressure Alex is feeling from her family to do well (current circumstance tactic, “while family is important they will be supportive of you no matter your academic success”).

Relationship scenario. Here, situation-focused reappraisal addressed the possibility of the relationship not being over, whereas goal-focused reappraisal addressed Alex’s desire to stay in this particular relationship. Most reappraisals in this scenario were at least partly focused on reinterpreting the goal, by telling Alex she is better off by being out of the relationship (explicitly positive: “Why would [Alex] want to be with someone who is meant to love her if he can end things so easily over something so small”), changing the current focus (“think about what [Alex] has learnt [from the relationship breakdown] about himself and relating to others is general”) or future consequences (“She is still so young and has so much time to find someone who she really loves and loves her back”). Of the responses that did include situation-focused reappraisal, almost all were focused on how the current circumstances may not lead to the ending of the relationship (“Sometimes even happy couples get upset, angry and frustrated with each other. This is normal”, “The boyfriend may have been having a bad day, or an upsetting event may have occurred outside of the relationship, which is making him react poorly to the fight.”)

Work scenario. All except one participant used some form of situation-focused reappraisal, which involved challenging Alex’s assumption that the current balance of work and university study is unsustainable, given his work shifts keep being changed. Most common was reappraising the current context, telling Alex how lucky he is to have the current job (“While they keep rearranging his shifts the last minute, at least he’s still with the

company and not fired or something”), and to think differently about the free time when not working (“although she is missing out on work, it seems this would give Alex more time to study”); future-focused reappraisal suggested keeping in mind Alex’s longer-term goals (“I would advise Alex to remember how important this job may be for her future career... she should think of this as doing the hard yards for the reward of a promotion at the end”) and that the situation is likely to improve soon (“It may be difficult now, but things are bound to get better once you finish your degree”). Of those who used goal-focused reappraisal for the work scenario, most focused on the opportunity to pursue work in the future as opposed to now (“[Alex] has lots of time to get a job and doesn’t have to achieve everything at once”).

Differences within scenarios. Within each scenario, we investigated the use of each tactic across the situation- and goal categories, to see if the use of tactics varied systematically between situation and goal categories. The tactic by category interaction was statistically significant for all three conditions (university: Wald $\chi^2(5) = 102.914, p < .001$; relationship: $\chi^2(5) = 35.439, p < .001$; work: $\chi^2(5) = 22.222, p < .001$), indicating that the use of tactics did vary between situation- and goal-focused reappraisal. To understand where the differences existed, the counts of tactic used can be seen in Table 4. Within the university condition, active tactics (agency, planning) were more often used via situation focus, whereas passive tactics (current, future) were more commonly used via goal focus. In the relationship condition, the situation-focused tactic predominantly used was current, followed by agency and planning, whereas common goal-focused tactics were positive, current and future. Finally in the work condition, current and future were the situation-focused tactics, whereas few people used goal-focused tactics (though future was the most common).

Co-occurrences. Common co-occurrence of tactics within each category (situation- or goal-focused) for each scenario can be found in Table 5 below, with data depicting the most

common co-occurrences displayed. No combination of goal-focused tactics was commonly used for the work scenario.

Table 5

Co-occurrences of situation- or goal-focused tactics within each scenario.

Scenario	Situation-focused tactics	%	Goal-focused tactics	%
University	Current, agency, planning	33	Current, future, accept, planning	43
Relationship	Current, planning, agency	31	Positive, Current, Future	33
	Current, positive	9	Current, Accept	5
Work	Current, future, planning, agency	40		

Note. Of participants who used two or more tactics, numbers in the table indicate what percentage of the sample used each combination of tactics, within those who used either situation- or goal-focused reappraisal respectively.

Across all three scenarios within situation-focused reappraisal, current circumstances, agency and planning tactics were often used together. However, in the work scenario, agency was often used with the aforementioned three, and in the relationship scenario, current and explicitly positive were sometimes used together. In contrast, within goal-focused reappraisal, the clusters of tactics were quite different across the three scenarios. This demonstrates that the combined use of tactics is fairly dependent on the properties of the situation when individuals are reappraising the goal (with there being no common associations for the work scenario), whereas when reappraising the situation, around one third of participants change features of the current circumstance and also use active tactics (agency and practical).

Demographic differences. Only two differences in tactics were found according to participants' demographics. None of the 27 female participants in the university condition used the positive tactic within goal-focused reappraisal, whereas one of 13 male participants did ($\chi^2 = 4.911, p = .027$). Of those participants who used future reappraisal within the goal-

focused category, there was a smaller proportion of Asian-Pacific participants (only 1, 3%) as opposed to Australian (24, 77%) and other ethnicities (6, 19%), $\chi^2(2) = 6.953, p = .031$.

Some differences were observed between male and female protagonist conditions, and can be seen in Table 6, which suggests participants think that future and planning situation-focused reappraisal and current goal-focused reappraisal is less appropriate for males than females.

Table 6

Tactic use by to the gender of the protagonist.

Tactic	% (<i>n</i>)		$\chi^2(1)$	ϕ
	Male	Female		
Relationship Scenario				
Current goal-focused	51 (18)	27 (10)	4.506*	.250
Future situation-focused	0	14 (5)	5.083*	.266
Planning situation-focused	3 (1)	19 (7)	4.698*	.255
University Scenario				
Current goal-focused	21 (8)	48 (19)	6.393*	.284

Note. Data in cells are percentages (with counts in parentheses). Only significant results are shown. * $p < .05$. ϕ = Cramer's phi effect size.

Discussion

This study is the first to our knowledge to systematically investigate and validate ways of commonly using cognitive reappraisal in a large sample using everyday, real-life problems. Using three fixed scenarios allowed us to assess whether the use of reappraisal categories and tactics varied systematically according to the type of situation they are applied to, and we have demonstrated that both do.

Choice of Reappraisal

Reappraisal intent: Situation or goal focus. A clear distinction was found in responses according to whether participants reappraised the relevance of the situation for the protagonist's higher-order goal, or whether they altered the goal itself. The existence of this

categorisation structure demonstrates that both these types naturally exist in individuals' use of reappraisal, and serves as a helpful schematic for categorising reappraisal attempts.

Furthermore, whether participants used situation- or goal-focused reappraisal across the scenarios varied according to the features of the scenarios themselves, as predicted. Responses in the work condition, where the undesired outcome was seen as being relatively unlikely to eventuate, were almost solely focused on changing the view of the situation. Conversely, the majority of relationship scenario responses did not include situational reappraisal at all, which was consistent with our hypothesis, given that relationship breakdown was rated as more likely to eventuate. While we predicted that the university condition would follow the same pattern as the work condition, responses to the university condition were actually more evenly split between situation and goal-focus than we expected. Based on the responses themselves, an additional element seemed to be present in the participants' evaluations: the worthiness or importance of the goal.

A proportion of participants in each condition used goal-focused reappraisal without engaging with the likelihood of the future event: Regardless of whether the outcome would eventuate or not, participants advised that Alex re-evaluate his goal. This was most commonly applied in the university condition, and least commonly in the relationship condition. Based on the responses themselves, the reason for the differences in proportions between scenarios seem to depend on participants' desire for Alex to adopt a better goal than the one already held, regardless of whether the undesired outcome occurs or not. For example, in the university condition, Alex was advised to re-evaluate his reasons for wanting to do well on the assessment (e.g., "consider *why* it is such a priority and whether the importance placed on academic success is the result of his own desires or his family's influence"). Though slightly less common, similar themes arose in the work condition ("it might be helpful for Alex to put less emphasis on this being the only job that will help him in

his career”), also regardless of whether Alex could successfully balance work and university. In these two conditions, regardless of whether the outcome eventuates, participants chose to suggest that Alex reappraise the goal, seemingly because they deemed it not worthy of being held, or that it would be in Alex’s best interest to do so. Those responding to the relationship scenario, instead, seemed to need the certainty of the outcome to trigger reappraisal of the goal. Furthermore, because participants used this outcome-irrelevant goal-focused reappraisal irrespective of the likelihood of the outcome occurring, this evaluation of worth seemed to take place prior to an assessment of the ambiguity of the situation. Based on these results, it seems that if the goal is worthy of being held, it should only be changed if there is evidence that it cannot be fulfilled. If a goal is deemed unimportant, then regardless of whether it can be fulfilled or not, the recommended course of action is to change it. This evaluation, while unexpected, adds another interesting element to the reappraisal process.

Reappraisal content: Tactics. As we hypothesised, two of the reappraisal tactics developed by McRae and colleagues (2012), reality challenge and distancing, were not confirmed by the data, likely due to the difference in the nature of the emotion-eliciting event between McRae et al.’s study and the current one. The use of reality challenge and distancing, therefore, seems to be limited to what may be referred to as *passive situations* (Blascovich & Tomaka, 1996): those that elicit an emotional response but require no direct involvement from the individual, such as watching a film or viewing a photo (as in McRae et al.’s study; also see Shiota & Levenson, 2012).

In contrast, the other six tactics were repeatedly found in participants’ responses, demonstrating their applicability to *motivated performance situations*: circumstances that require an active cognitive response from the individual (Blascovich & Tomaka, 1996). Furthermore, these six tactics were differently employed across the three conditions, demonstrating that they are differently appropriate. As predicted in Hypothesis 2, the use of

specific tactics seemed to be dictated by the perceived controllability of the situation. Active tactics (planning and agency) were used more often in scenarios that were open to active intervention on the protagonist's part (the university scenario), and passive tactics (e.g. current and future circumstances) were comparatively more commonly used in scenarios that did not require action, but instead would benefit from passive re-evaluation of the situation: predominately the work scenario.

Reappraisal process. As evidenced by the data, we propose that when faced with a problem to reappraise, individuals engage with the following process, depicted in Figure 1. Firstly, the goal itself is evaluated: Is it worthy of being held? If not, goal-focused reappraisal is engaged. If the goal is evaluated as worthy, the certainty of the future outcome is evaluated: How likely is it to occur? If it is quite likely, the goal is again reappraised. If there is uncertainty, the final question is asked: How much control over the outcome does the individual have? If it is a situation that can be controlled, use of active tactics is most likely employed, to encourage the individual to do something to change the outcome. If the individual has little control over the outcome, the use of passive tactics is more appropriate. The distinction between these two levels of reappraisal, and the order proposed here, mirrors the distinction between different dimensions of appraisal processes, two of which are goal congruence and controllability, where both theoretical and empirical work suggests the latter occurs after consideration of the former (Scherer, 2013; Verduyn, Van Mechelen, Tuerlinckx, & Scherer, 2013).

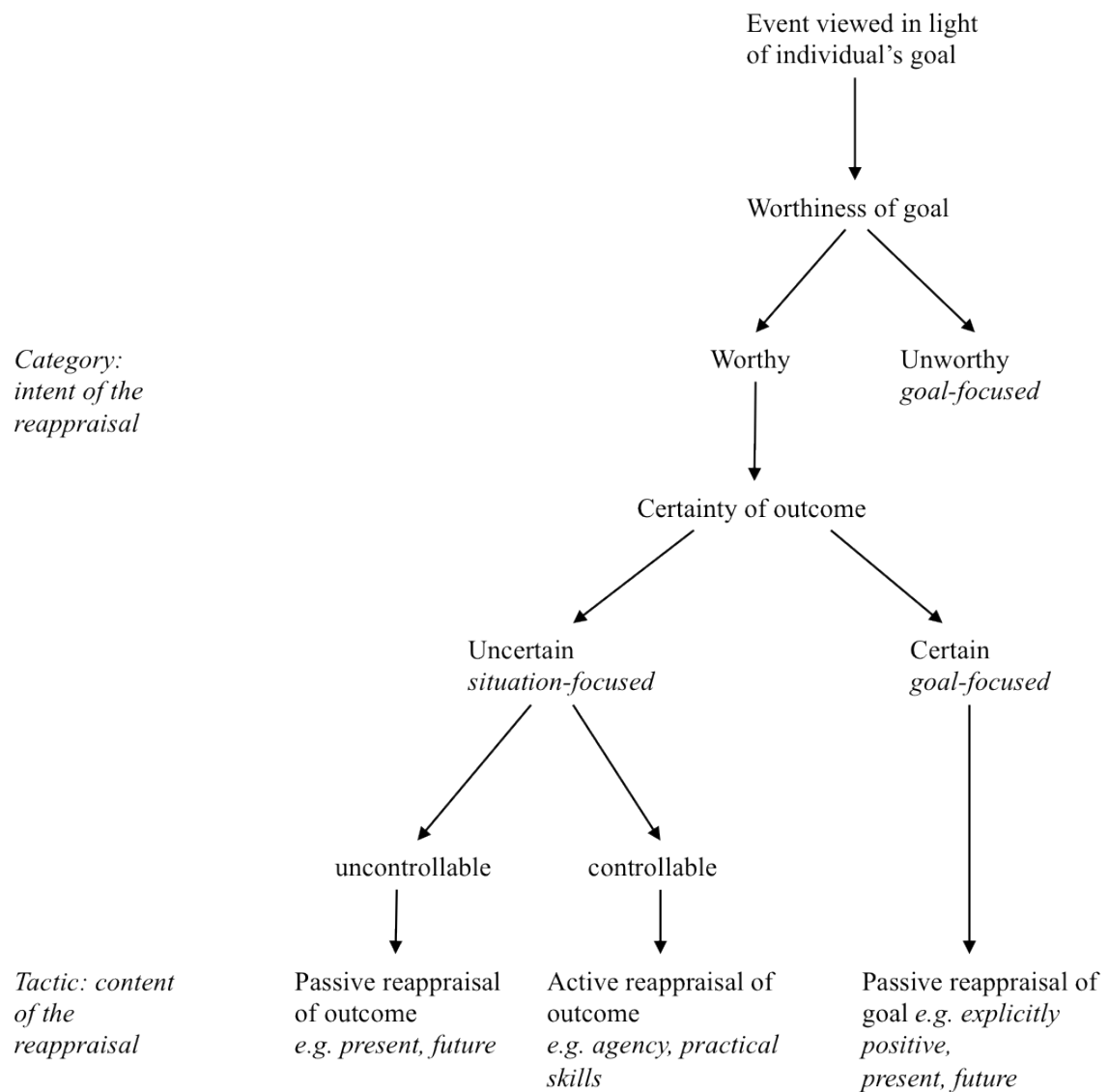


Figure 1. Process of reappraisal.

Multiple reappraisals. Interestingly, a large proportion of participants suggested that Alex try *multiple* ways to reappraise the present problem: One-third of participants used both reappraisal categories, and two-thirds used two or more tactics. Multiple reappraisals were most commonly used in the university condition, and least commonly used in the work condition. This may be a product of the task itself: Participants were asked to give Alex advice to make her feel better about the problem she is experiencing, and so they might have thought the best way to achieve this was to try a number of different ideas. However, it is also possible that this is how individuals naturally use reappraisal. Perhaps trying a number of

alternate perspectives is a better way of showing that alternate viewpoints exist, and thus provides more of a challenge to the original appraisal. Research has recently begun investigating the concept of reappraisal inventiveness, measured by individuals' ability to construct multiple different types of reappraisal (Weber, Loureiro de Assunção, Martin, Westmeyer, & Geisler, 2014). Future work should assess whether using a single reappraisal, or a multitude, is more effective in getting the individual to alter their view and/or improve their mood, and what conditions bring about multiple reappraisals.

Reappraisal in Real-Life

The large majority of reappraisal research to date has been conducted using simple experimental (e.g. film clips or photographs) stimuli as emotional triggers, and while this has proven useful, it likely limits our understanding of how individuals regulate daily emotional experiences (Blascovich & Tomaka, 1996). A strength of current study is its exploration of types of reappraisal in situations where the individual is personally involved in the scenario. We chose to ask participants to use reappraisal to give advice to another person, as opposed to asking them to reappraise an experience of their own, to try to access their knowledge on the ideal use of reappraisal (Weber et al., 2014, propose the distinction between the ability to generate reappraisals, and the typical use of reappraisal, which were uncorrelated in their study). We suspect reappraisal knowledge is more easily accessible in third-person, as opposed to first-person, circumstances. We also utilised this reappraisal advice paradigm to allow experimental control over the severity of the emotion-eliciting event. While we acknowledge the task did not involve participants experiencing the emotions themselves, but instead recommended the use of reappraisal to a (fictitious) third party, we do not see this as a limitation. If we were comparing the benefits of different types of reappraisal, then this methodology would be disadvantageous. However, given we were exploring different ways to reappraise, and the features of the situation that might make them more or less likely, this

methodology is appropriate, and advantageous. Additionally, some reappraisal work explicitly uses instructions to participants to reappraise by asking them to think of the situation from a third-person perspective (Kross & Ayduk, 2011; Ochsner et al., 2004). That said, we do wonder if the initial value-judgement of the goal that appeared present in participants' responses would occur when an individual is reappraising his or her own personal goal, or whether the holding of the goal inherently necessitates the value of it to the individual (the target of the goal is, by nature, desired by the individual whose goal it is; Austin & Vancouver, 1996). This is an important question for future research to investigate.

Reappraisal is characteristically defined as an antecedent strategy, by allowing the individual to change their view of the situation before the emotion has fully taken form (Gross, 2002). More recent work emphasises the need to acknowledge the iterative nature of this process (Gross & Thompson, 2007; Urry, 2009), and this was particularly evident in the current study's data. In the relationship condition, for example, a number of participants acknowledged the importance of allowing Alex to 'grieve' the end of the relationship before engaging in reappraisal to change her outlook and make herself feel better. Thus, a complete picture of reappraisal must encapsulate its use both before and after the emotion has been experienced. Given the opportunity to over-simplify this process in experimental paradigms, we argue that future research should partly be dedicated to these more everyday experiences of reappraisal, which might more commonly involve more iterations than lab-based reappraisal.

Summary and Future Research

This study has demonstrated two complementary ways of categorizing reappraisal. At the broadest level, two reappraisal categories focus on the *intent* of the reappraisal, either by changing the evaluation of the situation in its relevance for the desired goal, or by changing the goal itself. Nested underneath these categories lie six reappraisal tactics, which focus on

the *content* of the reappraisal. These tactics can be divided into those that encourage active engagement with the problem (agency and planning) and those that involve a more passive re-evaluation (explicitly positive, current circumstances, future circumstances and acceptance).

Furthermore, we have validated these types of reappraisal in a sample of individuals applying reappraisal to one of three realistic, common problems. The choice of reappraisal tactic and category was dependent on three evaluations of the current circumstance: Firstly, how worthy or important is the original goal? Secondly, how likely is it that the undesired event will occur? Finally, how much control does the individual have over the possibility of the event occurring? The three scenarios used here were demonstrated via validation testing in Study 1 to differ on the likelihood of the outcome eventuating and the control the protagonist has over the outcome, and Study 2 demonstrated that individuals differentially used types of reappraisal based on those features, as predicted.

The next logical step, after identifying the structure of reappraisal, is to see whether some types of reappraisal are more effective than others. McRae et al. (2012) found no real difference in the usefulness of the tactics in their study, but as discussed earlier, this could be a product of how removed the participants were from the emotion-eliciting event. Explicitly instructing individuals to reappraise a personally relevant situation in a particular way, and comparing the effectiveness between types of reappraisal, would be the best way to assess any differences. Furthermore, it would be interesting to explore the role of cognitive control in the ability to engage in these different kinds of reappraisal, which is starting to be investigated for reappraisal more generally (Troy, Wilhelm, Shallcross, & Mauss, 2010; Weber et al., 2014). Future research should try to integrate these concepts in order to more thoroughly understand how and why the use of reappraisal differs between individuals. By doing so, we can move towards a more complete understanding of reappraisal.

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Chapter 6: TEI and Types of Reappraisal Under Stress

This chapter presents the final empirical study of the thesis, and in doing so unifies the work that was presented in the preceding chapters. The previous chapters have shown that reappraisal is relevant to understanding how high TEI individuals deal with stress, in that their greater use of reappraisal can explain their lower general distress (Chapter 4), but can also explain the greater (short-term) increase in stress that they experience when faced with a challenging task (Chapter 3). Chapter 5 differentiated between two independent types of reappraisal, situation- and goal-focused reappraisal, and showed that contextual factors can predict individuals' use of one over the other.

The present chapter, thus, aims to bring together the investigation of reappraisal, with the investigation of the impact of TEI on individuals' responses under stress, by examining, first, whether the use of situation- versus goal-focused reappraisal result in different patterns of physiological stress in response to an experimental stressor; second, whether TEI affects the change in physiological stress over time; and third, whether TEI moderates the differential effects of the two types of reappraisal on stress responses. Using a physiological measure of stress complements the work presented in Chapters 3 and 4, which used self-report methodologies, and also parallels work in the reappraisal literature, which commonly uses physiological indices to assess the impact of reappraisal. By investigating how TEI and types of reappraisal work together to explain reactions to stress, this chapter addresses Aim 4 of the thesis and will bring together the work presented earlier.

I was the major contributor to this co-authored paper. I conceived of the study myself, with input from Michael Jones. I collected the data (with assistance from Kelsie Boulton when two experimenters were needed in Study 1) and conducted the analyses. Lena Quinto helped with rating participants' videotaped speeches when two raters were needed. I drafted the first version of the manuscript, and both Michael Jones and Julie Fitness provided feedback and suggestions on multiple versions of the manuscript.

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With great effort comes great reward: Trait emotional intelligence differentially moderates
the impact of two types of reappraisal under stress

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Abstract

Research has shown that cognitive reappraisal decreases physiological arousal and reduces negative mood in stressful situations. The aim of the present two studies was to compare the impact of reappraisal that targets the present situation (situation-focused reappraisal, SFR) and that which targets the individual's wider goal (goal-focused reappraisal, GFR) on stress, and the moderating effect of trait emotional intelligence (TEI). Study 1 ($N = 39$) employed negative feedback prior to an impromptu speech, and measured positive and negative affect and objectively rated speech performance. Study 2 ($N = 45$) measured physiological arousal (skin conductance level, SCL) throughout an impossible cognitive task. Study 1 showed both GFR and SFR resulted in less increased negative mood compared to the control group, but failed to show any effect on speech performance. Study 2 found that SFR and GFR protected against increased SCL throughout the task compared to the control group, but that GFR was significantly more taxing in anticipation of the task. Further, TEI predicted greater increased SCL in anticipation of the task, but greater decreased SCL throughout the task, for the GFR group only. Thus, the benefit of reappraisal can vary dramatically, depending on what is reappraised and the individual's emotional dispositions.

Keywords: reappraisal; stress; trait emotional intelligence; affect; psychophysiology

With great effort comes great reward: Trait emotional intelligence differentially moderates the impact of two types of reappraisal under stress

Imagine you are waiting to be called for an interview for a promotion. You are feeling anxious, imagining the interview will go badly and that you will fail to convince the interviewers that you deserve the new job. You could remind yourself that despite your nervousness, you usually handle interviews well, and you deserve the promotion because you are a highly regarded and deserving candidate. Alternatively, you might rethink the importance of the promotion itself, noting that you really love your current position, and that the promotion would result in substantially more work for very little extra pay, and thus you would be better off not getting the promotion. In both scenarios, you are engaging in cognitive reappraisal, an emotion regulatory strategy that alters the interpretation of the emotion-eliciting event (here, the interview) in order to change the emotional experience (feeling anxious).

Reappraisal has been reliably shown to benefit individuals in lowering negative affect and lessening physiological stress responses (Ray, McRae, Ochsner, & Gross, 2010). However, as demonstrated here, the focus of the reappraisal can vary between altering the present situation's relevance in light of the individual's wider goal (labelled *situation-focused* reappraisal), and altering the individual's goal itself (*goal-focused* reappraisal). The aim of the present study was firstly, to compare the benefits of these two types of reappraisal, and secondly, to explore the role of trait emotional intelligence (TEI) in reappraisal processes. Research has shown that compared to low TEI individuals, high TEI individuals report more frequent use of reappraisal (Beath, Jones, & Fitness, in press; Chapter 4; Schutte, Manes, & Malouff, 2009). Our aim was to examine whether high TEI individuals benefit as much from reappraisal as their low TEI counterparts, and whether TEI moderates the impact of different types of reappraisal.

Cognitive Reappraisal

Cognitive reappraisal is among the most widely researched emotion regulation strategies, and has demonstrated benefit to individuals in both therapeutic (Smits, Julian, Rosenfield, & Powers, 2012) and experimental contexts (Ray et al., 2010). The benefit of reappraisal lies in its ability to mitigate or change an initially stressful emotional response to a more adaptive one before the emotional experience has fully formed; hence it is referred to as an antecedent regulatory strategy (Gross, 1998b). By altering the individual's initial perception of the emotion-eliciting stimulus to a more benign one, the individual generally experiences less negative affect and weaker physiological stress responses (Gross, 2002).

When investigating the benefit of reappraisal in response to laboratory stressors, participants are typically asked in a general way to 'think differently' about the stressor (e.g., "think about the picture in a way that decreases your negative affect", Ray et al., 2010, p. 588; "[reinterpret] an unpleasant picture so that it no longer elicited a negative response", Hajcak & Nieuwenhuis, 2006, p. 293). These instructions allow for substantial variation in the way participants undertake the reappraisal task. Recently, a more detailed categorisation system of ways to reappraise was developed by McRae, Ciesielski, and Gross (2012). This identified eight, distinct reappraisal tactics, such as thinking that one is better off for the event occurring (explicitly positive) and believing that the situation will get better with time (change future consequences). Alternatively, Shiota and Levenson (2012) proposed a distinction between positive reappraisal (finding something of benefit in the situation) and detached reappraisal (viewing the emotion-eliciting stimulus objectively, from a detached perspective).

While these classification approaches focus on the *content* of reappraisals, we argue that another useful way to categorise reappraisals focuses on their *intent*. Given that negative emotions arise when a current situation is appraised as goal-incongruent (Barrett, Mesquita, Ochsner, & Gross, 2007; Stein, Hernandez, & Trabasso, 2008), and that the intent of

reappraisal (as discussed here) is to alleviate negative emotions, we argue that reappraisal of a stressful stimulus can take place in one of two ways: first, one can change the appraisal of the situation so that it is no longer goal-incongruent (*situation-focused* reappraisal), or second, one can change the goal itself (*goal-focused* reappraisal). While both types of reappraisal alter the interpretation of the emotion-inducing present circumstance, they do so by focusing on different aspects of the situation-goal setting.

This dichotomy has been validated in individuals' use of reappraisal (Beath, Jones, & Fitness, 2015a; Chapter 5), and found to be independent from, although complementary with, McRae et al.'s (2012) proposed tactics. What has not been identified to date, however, is whether there is any difference in the impact of situation- or goal-focused reappraisal for individuals when attempting to regulate their emotional responses. The first goal of the present study, then, was to examine whether the effects of reappraisal would vary according to the type of reappraisal undertaken: situation- or goal-focused.

Emotional Intelligence, Reappraisal and Stress

Along with reappraisal in the proximal context of a stressful situation, a potentially important dispositional variable that is also associated with individuals' responses to stress is trait emotional intelligence (TEI). TEI has been defined as an individual difference measure relating to self-reported confidence in understanding and regulating emotions (Petrides, Furnham, & Mavroveli, 2007), and research has demonstrated that compared to low TEI individuals, high TEI individuals experience less general stress and anxiety (Martins, Ramalho, & Morin, 2010), and experience less negative affect (Mikolajczak, Petrides, Coumans, & Luminet, 2009) and anxiety (Beath, Jones, & Fitness, 2015b; Chapter 3) when faced with a specific stressor. One explanation for this association involves individuals' appraisals, or interpretations, of the stressful event: Compared to low TEI individuals, high TEI individuals tend to view stressors as a challenge, rather than a threat, and they hold stronger beliefs in their

coping abilities (Mikolajczak & Luminet, 2008). Further, research has demonstrated a positive association between TEI and chronic use of reappraisal, which is unsurprising, given that dispositional emotional regulation abilities are subsumed within TEI: Those who score highly on measures of TEI believe they can and do regulate their emotional responses in an efficient and beneficial manner (Schutte et al., 2009).

While it is evident that both TEI and reappraisal are associated with more adaptive emotional responses to stress, we were interested to explore whether TEI moderates the benefits of reappraisal for reducing the experience of negative affect. Specifically, we explored whether participants who were given explicit reappraisal instructions (either situation- or goal-focused) in the context of a stressful situation would differentially benefit, depending on their TEI. In particular, we hypothesized that low TEI individuals might benefit more from reappraisal than high TEI individuals, given that the former are less likely to spontaneously reappraise than the latter. The extent to which this hypothesized advantage might also depend on whether the reappraisals were situation or goal-focused was an open question.

The Present Study

The present study set out to achieve two aims. Firstly, we wished to compare the benefit of reappraisal depending on whether or not participants reappraised the situation in light of the goal (situation-focused reappraisal) or reappraised the goal itself (goal-focused reappraisal). Study 1 pilot tested the two types of reappraisal instructions to establish the feasibility of the manipulation ahead of its use in Study 2. Secondly, we wished to examine whether TEI played a role in the benefit of reappraisal, and whether this differed between situation- and goal-focused reappraisal. This was explored in Study 2.

STUDY 1

Study 1 explored the situation- versus goal-focused reappraisal manipulation in the context of an impromptu speech task. Participants were told the best speech would win a prize

(the goal), and were given negative feedback on their initial speech plans (the situation that was incongruous with the goal). The reappraisal instructions anticipated the negative feedback that all participants received on their speech plans, and focused on reappraising the situation or the goal. We predicted that, compared to a no-reappraisal (control) condition, both types of reappraisal would result in a smaller increase in anxiety, and a smaller decrease in positive affect, in response to a stressor (Hypothesis 1). Given that we were exploring the two reappraisal instructions, we did not have any specific hypotheses about potential differences between situation- and goal-focused reappraisal. We also predicted that compared to the no reappraisal condition, both types of reappraisal would result in better speech performances (less apparent anxiety and more certainty over their arguments) (Hypothesis 2).

Method

Participants

Thirty-nine undergraduate psychology students (31 females in total, $n = 13$ participants randomly allocated to each group) from a large metropolitan university in Sydney were recruited for the study in which they participated in exchange for course credit and the chance to win a \$50 gift voucher. Participants' age ranged from 17 to 25 years old ($M = 19.36$, $SD = 1.97$). The majority of participants identified as Australian (80%), followed by Asian-Pacific (10%), and other nationalities (10%).

Measures

PANAS. Affect was measured using the positive and negative affect schedule (PANAS-X; Watson & Clark, 1994), with five items averaged for positive affect (attentive, strong, inspired, determined and interested) and four items averaged for anxiety (afraid, nervous, jittery, scared). All scale reliabilities were adequate (positive affect pre-task: Cronbach's $\alpha = .914$, post-task: .904; anxiety pre-task: .842, post-task: .896).

Social Anxiety. Because the performance task was a speech task, we included a social anxiety measure in order to control for differences that might impact on the outcome measures. The brief Fear of Negative Evaluation Scale (Leary, 1983) is a 14-item scale assessing participants' anxiety around social evaluations. Reliability was acceptable (Cronbach's $\alpha = .871$).

Speech ratings. Participants' speeches were recorded with a video camera and rated independently by two raters on two criteria, certainty (how certain and convincing they were in arguing their case) and anxiety (how anxious they appeared to be) on 11-point scales (0-10), with higher scores indicating more certain and anxious respectively. Raters were blind to all participants' allocation to study group. Inter-rater reliability was good (certainty: Pearson's $r = .818, p < .001$, Kendall's $W = .015, z = .571, p = .450$; anxiety: Pearson's $r = .799, p < .001$, Kendall's $W = .071, z = 2.613, p = .106$). Total scores were computed by averaging the two raters' scores. There was a negative correlation between anxiety and certainty scores, $r = -.621, p < .001$.

Procedure

When participants arrived for the experiment, the experimenter told them that the study involved giving an impromptu 3-minute speech on a current affairs issue (whether the Australian legal drinking age should be raised from 18 to 21). Participants were told they had to argue either for or against this proposal and make a cohesive and convincing argument, with the best argument awarded a \$50 gift voucher. They would have 5 minutes' preparation time, after which they would be instructed to enter their speech plan into the computer, and receive feedback on their plan, which they were told was designed to help them improve their speech to have a greater chance at winning the prize. Following this, they would have another 3 minutes to make any changes they wanted before giving their speech into a video camera, which would record their performance for rating purposes.

After completing demographic questions on a computer, participants were left for the initial preparation time. A research assistant then came into the room and directed them back to the computer to enter their speech plan and complete the PANAS. They were then told to wait until the feedback was being prepared, during which time the research assistant gave them reappraisal instructions (either situation or goal-focused) or no instructions (control group). Situation-focused reappraisal (SFR) participants were told to reappraise the feedback in order to get the most out of it to meet their goal (win the prize); goal-focused reappraisal (GFR) participants were told to reappraise the goal by thinking that it is not important if they win the prize, but to try to learn from the feedback more generally. (See full instructions in Appendix F.)

All participants received the same negative feedback on their speech plans (see Appendix F). SFR and GFR participants were reminded of their reappraisal instructions, and all participants completed the PANAS again. They were then left for their final preparation time, before the experimenter returned to record their speeches. All participants were then debriefed and told that the gift voucher would be randomly awarded to one participant once the study was over. After debriefing, all participants gave informed consent for their data to be used.

Results

Social Anxiety

Social anxiety was not predictive of changes in anxiety, $F(1,37) = 0.600, p = .395$ or positive affect, $F(1,37) = 3.216, p = .081$; nor was it correlated with either certainty ($r = .120, p = .468$) or anxiety ($r = .086, p = .601$) ratings. These findings suggest that social anxiety was not a potential confound; thus it was not included in any of the subsequent models.

Affect

Changes in anxiety and positive affect were tested in mixed general linear models (GLMs), with one within-subject factor (time: pre-feedback and post-feedback) and one

between-subject factor (group: control, SFR, GFR). The GLM results showed a significant time x group interaction for anxiety, $F(2,36) = 3.762, p = .033, \eta_p^2 = .173$; and positive affect, $F(2,36) = 3.406, p = .044, \eta_p^2 = .159$.

Contrasts were determined a priori to evaluate specific features of interaction effects; specifically, to examine whether the control group experienced a greater increase in anxiety and decrease in positive affect than both reappraisal groups over time, and whether there was any difference between the two reappraisal groups, as specified in Hypothesis 1. Follow-up (post-hoc) tests for statistically significant overall effects to investigate specific group differences were performed using a Bonferroni correction to maintain an overall type I error rate of 0.05 (test-wise alpha was set at $p = .017$). Contrast testing revealed the control group had a statistically significantly greater increase in anxiety than SFR and GFR averaged together, $F(1,36) = 10.236, p = .003, \eta_p^2 = .221$, but that there was no difference between SFR and GFR, $F(1,36) = 0.691, p = .411, \eta_p^2 = .019$. While a similar numerical pattern was seen in the positive affect means, none of the contrasts reached statistical significance (control versus SFR and GFR: $F(1,36) = 0.084, p = .774, \eta_p^2 = .002$; SFR versus GFR: $F(1,36) = 0.375, p = .544, \eta_p^2 = .010$). These results partially support Hypothesis 1.

Table 1

Descriptive statistics of PANAS and speech ratings across groups

Outcome	Time	<i>M (SD)</i>		
		Control	SFR	GFR
Affect				
Anxiety	Pre	2.94 (1.16)	2.08 (0.76)	2.31 (0.74)
	Post	3.25 (1.23)	1.90 (0.58)	2.25 (0.83)
Positive	Pre	2.46 (.889)	2.17 (1.15)	2.42 (0.88)
	Post	1.75 (0.65)	2.00 (1.01)	2.17 (0.90)
Speech				
Anxiety		4.46 (2.34)	3.92 (1.69)	4.62 (1.78)
Certainty		6.27 (1.87)	5.62 (1.23)	5.54 (2.06)

Note. *M* = mean. *SD* = standard deviation.

Speech Ratings

Speech ratings (certainty and anxiety) were analysed using one-way analysis of variance via GLM. Contrary to Hypothesis 2, there were no significant differences in speech ratings across the groups, anxiety $F(2,36) = 0.444, p = .645, \eta_p^2 = .024$; certainty $F(2,36) = 0.682, p = .512, \eta_p^2 = .037$. See Table 1 for means.

Discussion

The results of this pilot study showed that the reappraisal instructions were generally effective in mitigating the affective outcomes of the negative feedback, though there was no demonstrated difference between the two reappraisal groups (situation- vs. goal-focused reappraisal). While the lack of differentiation between the reappraisal groups was disappointing, any differences might have been too subtle to be picked up by the outcome measure, self-reported affect. Additionally, the goal that participants held (wanting to win the prize), might not have been sufficiently salient (since it was introduced at the beginning of the experiment) to impact self-reported affect. No differences were seen in speech ratings, which might have been due to the speech task itself lacking sensitivity, coupled with the natural variability in individuals' public speaking skill, to allow for obvious differences in performance.

Thus, study 1 demonstrated the viability of the situation- versus goal-focused manipulation as reappraisal instructions, in that both reappraisal groups demonstrated less affective reactivity than the control group, but it failed to find any differences between the two in terms of changes in affect or task performance. Study 2 improved on this by using a simpler experimental procedure that allowed for more targeted reappraisal instructions, particularly choosing an important goal that individuals held prior to the experimental manipulation, and a more sensitive outcome measure. The methodology in Study 2 allowed for more targeted hypotheses to be generated and tested compared to Study 1.

STUDY 2

For Study 2 we aimed to investigate the impact of reappraisal using a direct measure of physiological arousal as the outcome, rather than relying on self-reported affect, as we expected this would be more sensitive to between-group differences. Specifically, we decided to use skin conductance level (SCL), a physiological indicator of autonomic nervous system arousal that can co-occur with feelings of negative affect. Previous research has demonstrated that reappraisal lessens SCL reactivity coupled with negative emotions (Gross, 1998a; McRae et al., 2012; Urry, 2009). It has also been demonstrated that TEI predicts less physiological reactivity under stress, assessed via cortisol secretion (Mikolajczak, Roy, Luminet, Fillée, & de Timary, 2007) and heart rate variability (Laborde, Brüll, Weber, & Anders, 2011); we expected the same pattern of result for SCL.

While reappraisal can down-regulate the physiological affective response, there is also an argument that physiological measures including SCL are sensitive to the cognitive effort involved in actively reappraising (McRae, 2013). Given this, and given that we wished to compare two types of reappraisal, our assessment period was broken into two time points: the time before the cognitive task when participants were given their experimental instructions (including reappraisal) in anticipation of the task, called the instruction period; and the time during the task itself, when participants were faced with the negative affect-inducing stimulus, called the task period. We predicted that the goal-focused reappraisal instructions (GFR) would be more cognitively taxing during the instruction period, because greater self-assessment and evaluative effort would be needed for participants to consider and try to alter their goal, compared to situation-focused reappraisal (SFR) group, who only had to change their interpretation of the task itself. Furthermore, as discussed earlier, we wished to see whether TEI moderated the benefit of reappraisal on SCL, and whether this varied between the two types of reappraisal.

The specific predictions were as follows. First, we predicted that compared to the control group, both reappraisal groups would demonstrate a smaller increase in SCL during the task period (Hypothesis 1), and that due to increased cognitive effort, participants in the GFR condition would demonstrate a greater increase in SCL during the instruction period than participants in the SFR condition (Hypothesis 2). We also predicted an interaction between TEI and increase in SCL; specifically that TEI would predict a smaller increase during the task period (Hypothesis 3).

Hypotheses 1-3 investigated relatively simple effects; however, we also predicted a more complex proposition, specifically that TEI will moderate the difference in SCL between participants in the SFR and GFR conditions, in both the instruction and task periods (Hypothesis 4). TEI was investigated via its components (factors) for this hypothesis, to better understand what is driving the moderating effects.

Method

Participants

Forty-nine undergraduate psychology students completed the experiment in exchange for course credit, and were randomly allocated to one of three experimental conditions: SRF, GFR, or control. Data from four participants were excluded (three due to technical malfunction of the physiological equipment and one due to the participant guessing the experimental manipulation), resulting in a final sample of 45 (control: $n = 14$, SFR: $n = 15$, GFR: $n = 16$). These participants ranged in age from 18 to 45 ($M = 20.53$, $SD = 5.88$). Most participants identified as either Caucasian Australian ethnicity (49%) or Asian-Pacific (49%), and 2% identified as Middle-Eastern. All participants were enrolled in a psychology degree, and most reported a moderate desire to have a career in psychology in the future (on a 9-point scale of desire to have a career in psychology, with higher scores representing a stronger desire, $M = 4.64$, $SD = 3.29$).

Measures

SCL. Participants' SCL was continuously recorded throughout the experiment using a galvanic skin response (GSR) amplifier connected to a PowerLab 4/35 data acquisition device (ADInstruments, 2014). Electrodes were applied with NaCL-containing electrode gel before being connected to the palmar surfaces of the second and fourth fingers of the participant's non-dominant hand. Input was recorded using four samples per second. Data were recorded using the compatible Labchart 8 software. Following data collection, after the removal of measurement artefacts, results for each participant were averaged for each minute then averaged for three time points: baseline, task instructions, and task completion. Each of these was then converted to a z score by subtracting the participant's overall mean and dividing by their standard deviation, in order to control for differences in variation between participants (consistent with Troy, Wilhelm, Shallcross, & Mauss, 2010).

TEI. TEI was measured using the trait emotional intelligence questionnaire (TEQue; Petrides, 2009), a well-validated and commonly used 153-item survey. The total score and factor scores (emotionality, wellbeing, self-control and sociability) were used in this study.

Personality. TEI, particularly as assessed by the TEIQue, has shown to consistently correlate with each of (low) neuroticism, extraversion, openness to experience, conscientiousness and agreeableness (Petrides, Pita, & Kokkinaki, 2007). Thus, in order to control for potential shared variation, we included each of the five factor model of personality traits, which were measured with ten items each, taken from the International Personality Item Pool, based on the NEO-PI-R (Goldberg et al., 2006).

Reappraisal instructions. Both reappraisal groups were told to try to think about the task in a way that would ensure they remained relaxed. Instructions to SFR participants involved rethinking the task itself in its relevance to their goal: *"It might help you to think about the task as if it's really unimportant, and will have no bearing on your future."*

Instructions to GFR participants targeted their goal of having a career in psychology: *“You could think that it doesn’t matter if you have a career in psychology, there are lots of other careers you could have instead.”*

Cognitive task. Participants were given five items from Raven’s advanced progressive matrices (Raven, Raven, & Court, 1998), a general intelligence test that assesses pattern matching ability by asking participants to indicate which out of six options is the missing element of a series of patterns. This task was intended to be difficult for participants, particularly in the limited time available and their expectations beforehand (see explanation in the following section).

Procedure

The study was advertised to potential participants as a physiological study, which would require completing survey items and a very easy cognitive task. Upon signing up to the study, participants were emailed a link to the survey portion of the study (demographics, TEI and personality), which they completed online before their on-campus experimental session. Upon arrival at the experimental session, participants were connected to the GSR equipment and instructed to sit quietly and try to relax as much as possible for one to two minutes before the recording began. They then completed other instruments on the computer that are not relevant to this study. Next the experimenter told participants that they would complete a cognitive task, which was particularly easy for psychology students, but also shown to be predictive of future success in a psychology career (modelled on Mikolajczak et al., 2009). All participants were told to try to stay as relaxed as possible while completing the task so that the physiological data would be as accurate as possible, and the specific reappraisal instructions given to the two reappraisal groups were framed as a way of staying relaxed. Participants were given five minutes to complete the cognitive task, after which time they were instructed back to the computer to complete other self-report instruments. After this, physiological recording was

stopped and participants fully debriefed, and all participants gave informed consent to use their data.

Results

Time effect

There was a significant difference in SCL across time regardless of reappraisal group, Wilks' Lambda $F(2,40) = 5.800, p = .006, \eta_p^2 = .225$; $M_{baseline} = .374, SD = 1.690$; $M_{instructions} = 1.477, SD = 2.898$; $M_{task} = 3.039, SD = 3.639$.

Personality x time effects

Neuroticism, openness, agreeableness and conscientiousness did not predict change in SCL over time (see Appendix F Table 1 for statistical results). Extraversion almost reached significance ($p = .065$), thus to be thorough all subsequent models were refit to include extraversion, which failed to reach significance in any models. Given this, no personality factors were included in any of the subsequent models.

Hypotheses 1-3: Group x time and TEI x time

Three (group) x 3 (time) mixed general linear models (GLMs) were used to assess change in SCL across three time points, with TEI as a covariate, to test Hypotheses 1-3. Contrast testing was used to follow up a significant group x time interaction, using a Bonferroni correction to maintain an overall type I error rate of 0.05 (test-wise alpha was set at $p = .017$). There was a significant group x time interaction, Wilks' Lambda $F(4,80) = 4.304, p = .003, \eta_p^2 = .177$. Contrast testing demonstrated that from baseline to instructions, SCL for the GFR group increased more than for the participants in the SFR group: contrast estimate = 2.183, 95% CI [0.700, 3.667], $F(1,41) = 8.839, p = .005, \eta_p^2 = .177$. However, from instructions to task, the SCL of control group increased more than the average of SFR and GFR groups: contrast estimate = 4.604, 95% CI [1.418, 7.790], $F(1,41) = 8.515, p = .006, \eta_p^2 = .172$. See Figure 1.

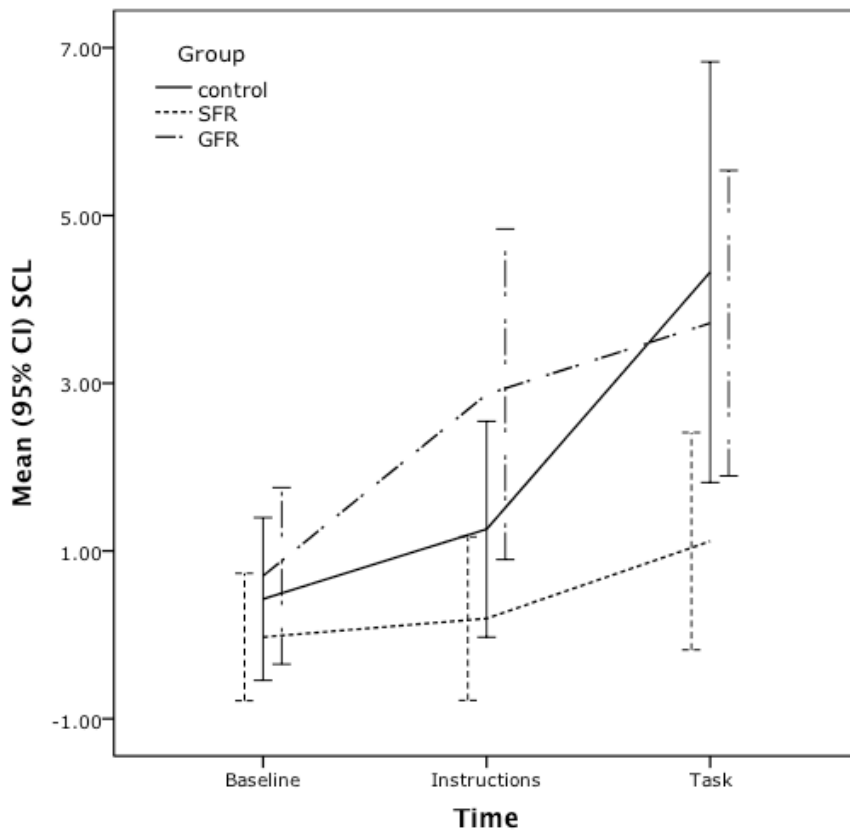


Figure 1. Association between skin conductance level and time by group.

There was also a significant TEI x time interaction, Wilks' Lambda $F(2,40) = 4.205, p = .022, \eta_p^2 = .174$. Inspection of change in parameter estimates showed that as TEI increased, SCL increased from baseline to instructions (at baseline: $b = 0.00, SE = 0.51$; at instructions, $b = 0.73, SE = 0.80$), and decreased from instructions to task (at instructions, $b = 0.73, SE = 0.80$; at task, $b = -1.37, SE = 1.00$). This shows that compared to low TEI participants, high TEI participants had a greater increase in SCL prior to the task, and a greater decrease in SCL during the task.

Hypothesis 4: Group x TEI x time

This hypothesis was addressed by fitting a 3-way (group x TEI x time) interaction, which was significant: Wilks' Lambda $F(4,76) = 2.699, p = .037, \eta_p^2 = .124$. This suggests that TEI does moderate the effect of reappraisal on change in SCL. Given the continuous nature of

TEI, contrast testing could not be used to follow up this interaction. Instead, to explore the effect, we used the Johnson-Neyman technique for probing an interaction (Hayes & Matthes, 2009) via regression, and calculated difference scores (instructions minus baseline as difference 1, and task minus instructions as difference 2) to use as dependent variables in the regression models. This allowed us to analyse the point on the TEI scale at which the difference in SCL between the SFR and GFR groups was significant. Because we were probing the interaction as a follow-up test to an overall significant effect, we used a conservative alpha level (significant at $p \leq .01$).

From baseline to instructions, the minimum level for a significant difference between participants in the SFR and GFR conditions with respect to change in SCL was $TEI = 4.31$; at this point and greater, participants in the GFR condition experienced significantly greater increase in SCL than participants in the SFR condition (see Figure 2). From instructions to task, the minimum level for a significant difference ($p \leq .01$) between participants in the SFR and GFR conditions with respect to change in SCL was $TEI = 5.00$; at this point and greater, participants in the GFR condition experienced significantly greater decrease in SCL than participants in the SFR condition (see Figure 3). This supported Hypothesis 4, and showed that the reappraisal instructions were differentially beneficial depending on participants' TEI.

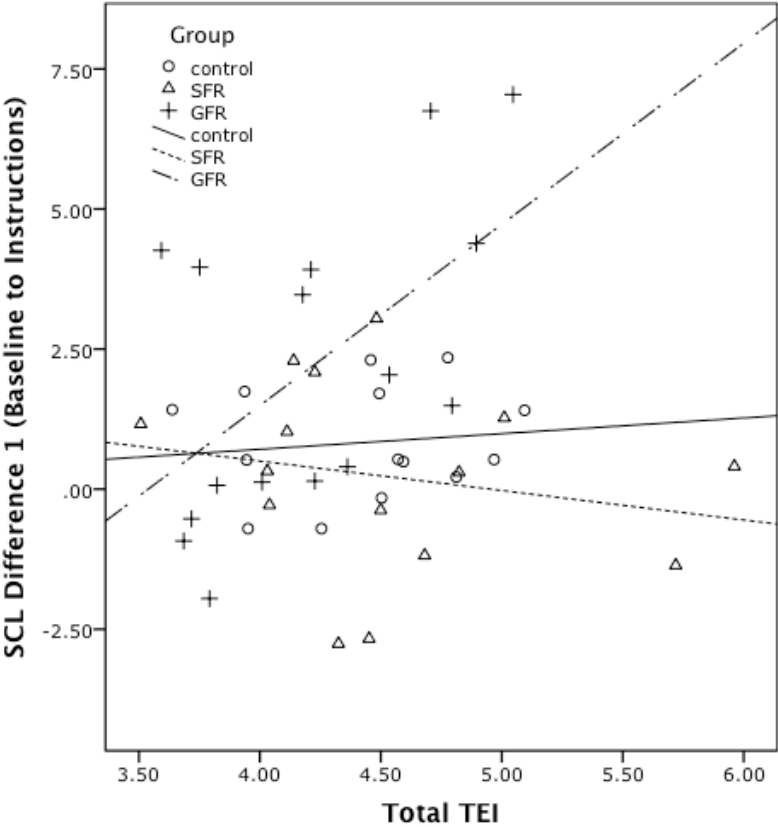


Figure 2. Association between total TEI and change in SCL (pre-task) by group.

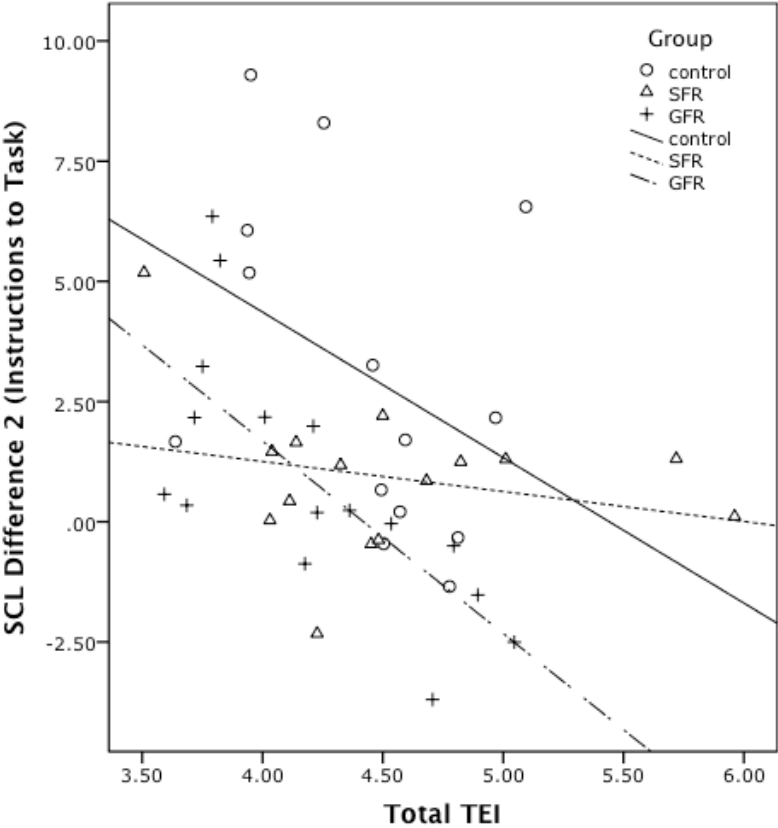


Figure 3. Association between total TEI and change in SCL (throughout the task) by group.

We also wished to explore the four TEI factors to better understand which component was driving the moderating effect. Using a Bonferroni correction to maintain an overall type I error rate of 0.05 (test-wise alpha was set at $p = .0125$) to assess the 3-way interaction involving each factor separately, we ran four separate GLMs with each of the four TEI factor scores: emotionality, wellbeing, self-control and sociability. The emotionality model contained a significant 3-way interaction (emotionality x group x time): Wilks' Lambda $F(4,76) = 3.624$, $p = .009$, $\eta_p^2 = .160$ and the wellbeing model contained an almost significant interaction (wellbeing x group x time): Wilks' Lambda $F(4,76) = 2.758$, $p = .034$, $\eta_p^2 = .127$. By inspecting both parameter estimates and graphs, it was clear that during the instruction time period, similar differences between the three groups were seen for both wellbeing and emotionality, consistent with the total TEI pattern (see Figure 2). However, the difference between the groups was represented differently in the two TEI factors between throughout the task time period (see Figures 4 and 5). For both factors, GFR participants showed the strongest positive association between TEI and change in SCL. However, the slopes for the control and SFR participants are quite different between the two factors. Specifically, control and SFR participants showed a similar relationship between wellbeing and SCL change: As wellbeing increased, SCL change slightly decreased (and participants in the SFR group had a lower mean decrease compared to participants in the control condition). There was a moderate, negative relationship between emotionality and SCL decrease for control participants, but no relationship between emotionality and SCL change for SFR participants.

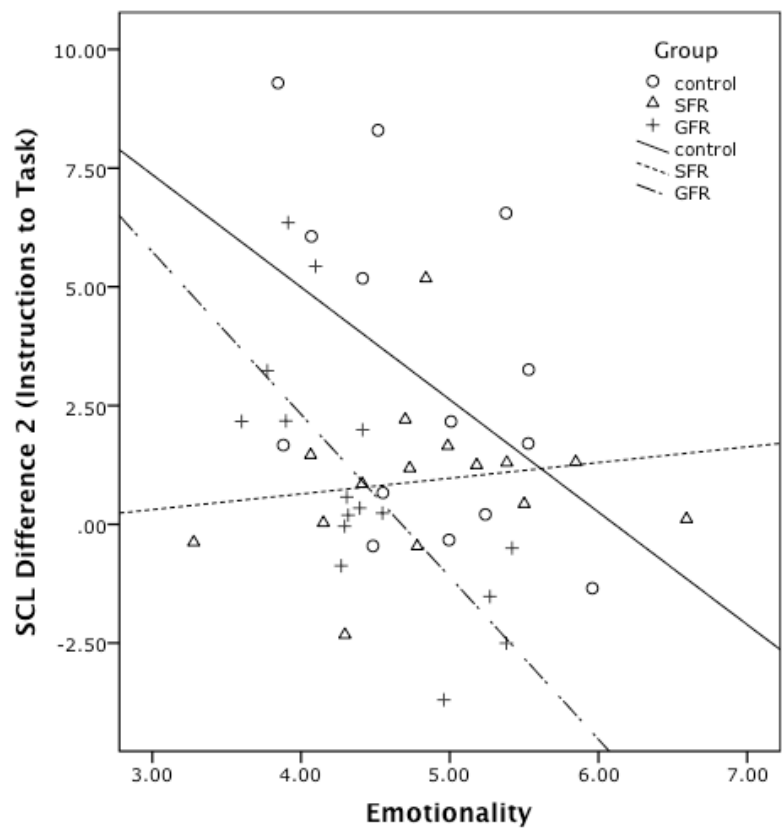


Figure 4. Association between emotionality and change in SCL (throughout task) by group.

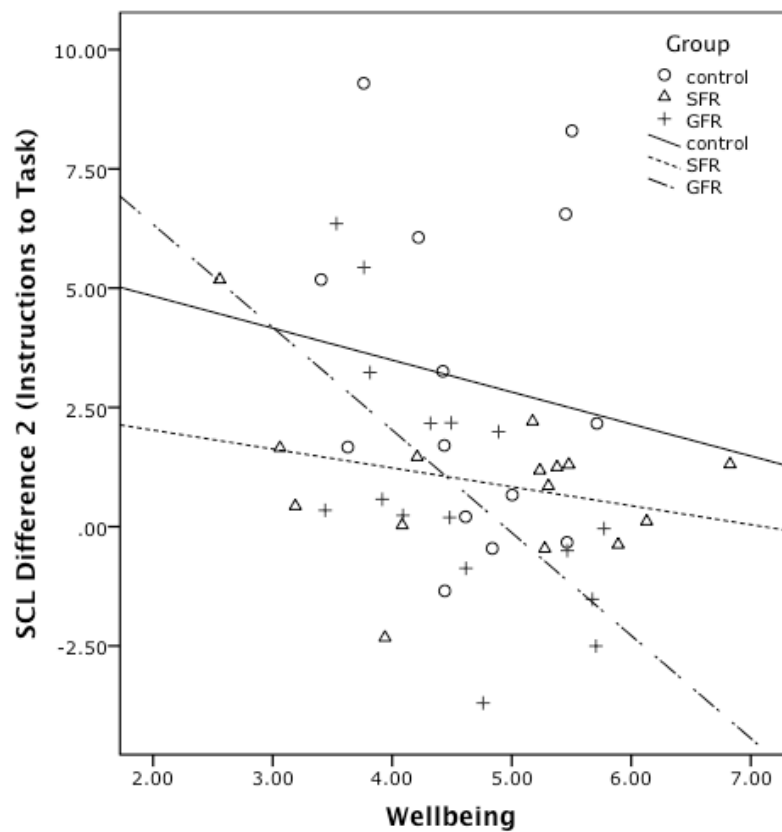


Figure 5. Association between wellbeing and change in SCL (throughout task) by group.

Discussion

Study 2 demonstrated that, compared to participants in a control group, participants who used reappraisal experienced a significantly smaller increase in SCL throughout the task period. There were also differences between the two reappraisal groups, in that the goal-focused reappraisal group experienced a larger SCL increase in anticipation of the task (instructions period), perhaps reflecting the greater cognitive load required to engage with and attempt to change their goal (McRae, 2013), compared to altering the meaning of the situation. We also found that, compared to lower TEI participants, higher TEI participants experienced a smaller increase in SCL throughout the task (though a larger increase in anticipation of the task). The most interesting results emerged from the combined analysis of reappraisal and TEI. Specifically, high TEI participants showed the largest increase in SCL in the goal-focused reappraisal condition, but subsequently were much less reactive during the task (some even experiencing a decrease in SCL throughout the task). In contrast, for the situation-focused reappraisal participants, TEI did not impact the change in SCL, which remained relatively stable both before and throughout the task.

GENERAL DISCUSSION

Studies 1 and 2 have demonstrated the utility of specific reappraisal instructions in the context of an experimental stressor: Participants in both reappraisal groups experienced less self-reported affective reactivity (Study 1) and less physiological reactivity (Study 2) during the period of the stressor compared to the control group. Of greater import, though, was that the reappraisal instructions were differentially beneficial, depending on TEI.

Situation- versus Goal-focused Reappraisal

Situation-focused reappraisal instructions (i.e. interpreting the task itself differently to lessen anxiety while keeping the wider goal intact) were the most beneficial for dealing with physiological stress, irrespective of TEI. Results showed those in the situation-focused

reappraisal condition experienced the least increase in SCL, both in anticipation of, and throughout, the task. We argue that this type of reappraisal would be cognitively simpler than goal-focused reappraisal, as the individual's broader goal is not being targeted; the present context simply becomes irrelevant for that particular goal (Beath et al., 2015a; Chapter 5). In contrast, goal-focused reappraisal was initially more physiologically taxing, but throughout the task these participants were significantly more stable, especially high TEI individuals. The greater increase in arousal in the instruction period might have come from the more complex cognitive processes required to engage goal-focused reappraisal, which likely required a deeper affective engagement with the context.

Previous work by McRae and colleagues (2010) suggested that deeper cognitive processing of the emotion-eliciting stimulus takes place when individuals engage in reappraisal rather than distraction, and research conducted by Denson, Creswell, Terides, and Blundell (2014) demonstrated that reappraisal increased physiological arousal (specifically, cortisol reactivity) during social and physical stressors (see also Denson, Grisham & Moulds, 2011). Taken together, this previous work likely illustrates the taxing nature of the cognitive effort required when reappraising. Further, the reappraisal instructions used in Denson et al. (2014) were quite complex and, in light of the distinctions between types of reappraisal made in the current paper, combined multiple types of reappraisal, which likely added to the participants' cognitive load. Reappraisal that requires reinterpretation of situational aspects would be less challenging to an individual, and thus require less cognitive effort, compared to reappraisal that requires reinterpretation of an individual's goals. McRae et al. do note that given this deeper initial processing, reappraisal would likely be more effective long-term, given that cognitive processing has already taken place. While the present results suggest the same might be true for goal-focused reappraisal, future research can investigate this further (see Kalisch, 2009, for a similar discussion).

TEI

It seems that emotional self-efficacy is not required to incorporate, and benefit from, situation-focused reappraisal: TEI made no impact on its benefit. Individuals, thus, could use this type of reappraisal quite easily to reduce negative affect (though this altered interpretation is only feasible when the aspects of the situation can be reasonably altered, i.e. there is some ambiguity in the situation which allows for a different interpretation; see Beath et al., 2015a).

In order to more thoroughly understand what was driving the TEI moderating effect, we investigated the factors of TEI, and found it was primarily emotionality. The emotionality factor, also known as emotional skills (Mikolajczak, Luminet, Leroy, & Roy, 2007), comprises individuals' beliefs about how well they understand their own emotional states, their ability to communicate their emotions to other people, their capacity to engage in fulfilling relationships and their self-assessed empathy (Petrides, 2009). This greater perceived emotional ability might have meant that participants in the goal-focused reappraisal group exerted more effort when initially told to alter their goal; however, once their focus shifted to the task itself, their stress response lessened. While those low on emotionality did not show the same degree of increased arousal in anticipation of the task, their arousal continued to increase throughout the task, suggesting that they were less equipped to handle the stressor, which appears to be less beneficial to the individual. Thus, goal-focused reappraisal seems to be beneficial only for individuals who have the disposition and emotional skills to engage with it fully (see Troy et al., 2010, for a discussion of reappraisal ability).

Summary and Future Directions

As with all emotion regulation strategies, the benefit (or otherwise) of reappraisal is context-specific: No regulatory strategy is uniformly beneficial for all individuals across all situations (Aldao, 2013). Indeed, by examining two distinct time periods (in anticipation of the task, versus throughout the task), we have shown that the effect of reappraisal (in terms of

physiological reactivity) varies, and effects of sub-types of reappraisals also vary. The simpler form of reappraisal (which alters the interpretation of the situation) was less taxing for participants to implement, compared to the more complex goal-focused reappraisal, which was initially more detrimental. However, the opposite pattern was evident during the task itself. Furthermore, this study is the first to show that TEI moderates the impact of reappraisal. We have demonstrated that for individuals with a greater perceived emotional understanding, there is eventually more to be gained by reappraising a goal, but it comes at an initial cognitive cost: Engaging in goal-focused reappraisal initially will be more taxing compared to a simpler, but less beneficial long-term, reappraisal.

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Chapter 7. Conclusion

This thesis aimed to extend previous trait emotional intelligence (TEI) research (e.g., Austin, Saklofske, & Mastoras, 2010; Mikolajczak & Luminet, 2008; Mikolajczak, Petrides, Coumans, & Luminet, 2009) by exploring the measurement and utility of TEI in predicting psychological health. Specifically, the thesis examined how TEI can explain individual differences in coping with stress via two mechanisms: cognitive reappraisal and coping styles. This was achieved through five major works across Chapters 2 to 6. Chapter 2 presented a meta-analysis of personality factors (those in the five factor model of personality, FFM) and TEI, specifically exploring differences across TEI measurement tools. This meta-analysis demonstrated systematic variation in correlations between TEI scales and personality, suggesting that different scales are assessing different facets of the TEI construct. Chapter 3 illustrated that high TEI (relative to low TEI) individuals experienced a greater increase in stress, though smaller increase in anxiety, in response to a year-long stressor, and that this was explained by reappraisal (changes in stress), active coping styles (changes in stress) and avoidant coping styles (changes in anxiety). Chapter 4 demonstrated that TEI predicts lower psychological distress cross-sectionally, and that this prediction is explained by coping styles and to some degree by emotion regulation (reappraisal and suppression). Further, it showed that how and to what extent reappraisal, suppression and coping explain this association differed between three TEI scales. Chapter 5 explored the construct of reappraisal, identifying and validating two distinct approaches to engaging in reappraisal (situation- versus goal-focused reappraisal), and demonstrated that the features of the context in which reappraisal is engaged alter what kind of reappraisal is used. Finally, Chapter 6 showed that situation- versus goal-focused reappraisal differently affect an individual's response to an acute stressor, and that TEI exaggerated this difference. High TEI individuals were more stressed in anticipation of the task, but experienced a slight *decrease* in stress throughout the task, when using goal-focused reappraisal; conversely, TEI had little impact

on changes in stress for those using situation-focused reappraisal. Taken together, the findings of this thesis have significant implications for the field, as they show that cognitively engaging with a belief in one's emotional abilities (TEI), and cognitively engaging with what is required of the task at hand, is initially more taxing for the individual, but ultimately more beneficial, when presented with either a short-term or long-term a stressor.

In order to fully explore the implications of the work that has been conducted, and discuss how future research can build upon the present findings, this chapter will be structured as follows. First, it will contain a discussion of TEI, in light of the findings presented here, both in terms of the nature of the construct and how it is measured. Then, it will move on to discuss cognitive reappraisal, particularly cementing the distinction between reappraising the situation in light of the goal, and reappraising the goal itself, given that it has been demonstrated that this is both a valid and useful distinction to make. Next, a discussion of how TEI and reappraisal interact in explaining how individuals react adaptively to stress will follow, as the findings of how TEI and reappraisal interact was the crux of this thesis. Limitations of the work presented here will then follow, and a proposal of areas for future research to follow from what has been presented. This chapter will finish with general conclusions and a discussion of broader context within which the work sits.

The TEI Construct

The first aim of this thesis was focused on the construct of TEI itself; namely, is it a unified construct with a central, coherent definition and operationalisation? This was explored first by assessing the degree of systematic variation that exists between different TEI measurement tools in a meta-analysis of TEI and FFM personality traits in Chapter 2, and then by exploring whether differences across three TEI scales exist in how TEI predicts psychological distress in Chapter 4. The next two sections of this Conclusion will critically evaluate each of these ideas, and the findings of the thesis, in turn.

TEI and Personality

Perhaps one of the strongest areas of criticism of TEI has been the degree of correlation that exists with the five factors of the FFM (Davies, Stankov, & Roberts, 1998; MacCann, Schulze, Matthews, Zeidner, & Roberts, 2008; Mayer, Salovey, & Caruso, 2008). The results of the meta-analysis between TEI and FFM factors presented in Chapter 2, however, confirmed previous work (Joseph & Newman, 2010; van Rooy, Viswesvaran, & Pluta, 2005) and showed that TEI is not subsumed by the FFM personality traits. Average correlations including all TEI scales were moderate (of the five personality factors, the weakest pooled estimate was with openness, $r = .179$; the strongest pooled estimate was with neuroticism, $r = -.382$). When analyses were performed on only one personality measurement tool (the NEO-PI), the strongest association between a TEI scale (the TEIQue) and a personality factor (neuroticism) displayed shared variance just over 50% (pooled estimate $r = -.73$). While this is a strong correlation, it does not suggest that TEIQue-assessed TEI is merely a reflection of neuroticism.

Evidence for the unique predictive validity of TEI over FFM traits comes when explaining other dispositions and behaviours. The results of the cross-sectional study in Chapter 4 showed that neuroticism, openness, conscientiousness and agreeableness correlated moderately, and extraversion correlated weakly, with individuals' general stress and anxiety (not in the context of any particular stressor). However, when individuals were experiencing a high-stress year, as shown in Chapter 3, only neuroticism and extraversion were consistently predictive of stress and anxiety. Furthermore, when considering changes in stress and anxiety over time, extraversion and agreeableness predicted an increase in stress, and neuroticism predicted an increase in anxiety. Finally, none of the FFM traits significantly predicted change in physiological stress in the experimental study in Chapter 6. Thus, these results show that while there is a moderate degree of association between each FFM factor and TEI,

there is little possibility of FFM traits confounding the predictive ability of TEI, especially when research moves beyond correlational designs to investigate more complex phenomena: While TEI is predictive of these more complex constructs, FFM traits are not. In these contexts, FFM traits are much less relevant than TEI, and thus TEI is certainly a useful construct. Future work, thus, only needs to control for the association between TEI and FFM in areas that FFM traits are known to be predictive (e.g., DeNeve & Cooper, 1998; Judge, Heller, & Mount, 2002; Smith & Williams, 1992).

TEI Measurement

As was established in Chapter 1 of this thesis, there is little consensus among TEI researchers as to the specific definition, factor structure or measurement of TEI. Based on the conceptual analysis of researchers' individual conceptualisations of TEI that was performed in Chapter 1, it was established that a distinction can be made between models of those models of TEI that (1) include many various emotional self-perceptions and the broadest dispositions (e.g., Bar-On, 2006; Petrides & Furnham, 2000), (2) follow the initial Salovey and Mayer (1990) conceptualisation of emotional intelligence, though assessed through self-report rather than maximum-performance measures (Schutte et al., 1998), and (3) argue for the inclusion of the most specific, targeted facets (Wong & Law, 2002). The results of the meta-analysis in Chapter 2 supported this, as the most consistently strong correlations with FFM factors were found with the TEIQue (Petrides, 2009), followed by the AES (Schutte et al., 1998), and the most consistently weak correlations involved the WLEIS (Law, Wong, & Song, 2004). In line with these results, these three scales were chosen for inclusion in the cross-sectional study in Chapter 4, where it was demonstrated that there were important differences in their associations with psychological distress: While all three TEI scales predicted lower psychological distress (stress and anxiety), this association was explained by lower avoidant coping for the AES and TEIQue, whereas the WLEIS-distress association was

explained by greater use of reappraisal and lower avoidant coping, which predicted less distress; but, additionally, greater use of expressive suppression and religious coping, which predicted *greater* distress. This chapter showed that in terms of the mechanisms that explain the association between TEI and distress, the AES and TEIQue show the most similarity, whereas the WLEIS is quite discordant. The fact that the AES and TEIQue were more strongly associated with lower psychological distress than the WLEIS suggests that the key to the added strength of the AES and TEIQue in predicting lower psychological distress lies in the facets of TEI that are shared between them, but that are not covered by the WLEIS; namely, an individual's self-perceived ability to regulate other people's emotions, flexibility and motivation (see Table 1 in Chapter 1). The broader dispositions assessed by the TEIQue and not the AES (e.g., social skills and competence, dispositional happiness and optimism) seemed unimportant in predicting distress in this cross-sectional context.

However, as has been a focus of this thesis, there are substantial differences in explaining cross-sectional distress, as has just been discussed, compared with explaining changes in distress over time. The work in this thesis that investigated changes in distress over time used the TEIQue as the TEI scale, because it has been used in past research that formed the basis of the work conducted here (e.g., Mikolajczak & Luminet, 2008; Saklofske, Austin, Mastoras, Beaton, & Osborne, 2012; Sevdalis, Petrides, & Harvey, 2007). Petrides and colleagues' assessment of the various measurement tools for TEI is that the TEIQue is the only measure that comprehensively assesses the full TEI construct (Pérez, Petrides, & Furnham, 2005; Petrides, Furnham, & Mavroveli, 2007). Given the differences in how the construct is defined in the literature, as discussed at length in Chapter 1, this claim is difficult to evaluate. Empirical work does suggest that the TEIQue is predictively useful, particularly when investigating individual differences in the context of stress, as previous research (e.g., Austin et al., 2010; Mikolajczak et al., 2009; Saklofske et al., 2012), and this thesis (Chapters

3 and 6) have shown. The factor of the TEIQue that was largely driving the moderating effect in Chapter 6 was emotionality, which is made up of emotional perception, emotional expression, relationship skills and empathy subscales (Petrides, 2009). Self-reported emotional perception and expression are assessed in the AES and WLEIS, and some assessment of empathy is also present in their respective ‘appraisal of others’ emotions’ factors (in fact, Schutte et al., 1998, explicitly include empathy in this factor). These similarities suggest that the moderating effect demonstrated by the TEIQue (that is, the greater anticipatory increase in stress in Chapter 3, and physiological arousal experienced by individuals using goal-focused reappraisal in Chapter 6) might also be demonstrated using the AES and WLEIS. The next step in understanding the extent of the differences across TEI scales would be to test this hypothesis, as it would allow greater understanding of the commonalities between the scales by determining whether the subscales that are described similarly between scales actually measure the same phenomena.

Reappraisal

Given the conceptual similarities between TEI and ER (Peña-Sarrionandia, Mikolajczak, & Gross, 2015), another aim of this thesis was to examine whether reappraisal would play a role in the association between TEI and well-being. This was confirmed in Chapters 3 and 4. Given in particular the results of Chapter 3, which demonstrated that high TEI individuals reported greater use of reappraisal and subsequently experienced a greater increase in stress (though not anxiety), it was deemed important to explore the concept of reappraisal more thoroughly in Chapter 5, ahead of exploring its interaction with TEI in Chapter 6.

Situation- versus Goal-focus

While some previous work has proposed sub-types of reappraisal (e.g., (McRae, Ciesielski, & Gross, 2012; Shiota & Levenson, 2012), they have lacked a theoretically-

coherent framework under which to integrate distinct categorisations. Thus, Chapter 5 proposed a novel conceptual distinction between two types of reappraisal: re-evaluating the relevance of the present situation in light of the individual's higher-order goal, or re-evaluating the goal itself. It is widely acknowledged by emotion and appraisal theorists that the relevance of the particular goal that the individual holds is crucial to the elicitation of emotion (Barrett, Mesquita, Ochsner, & Gross, 2007; Frijda, 1986; Lazarus & Folkman, 1984; Scherer, 2001), and this has been demonstrated empirically (e.g., Verduyn, Van Mechelen, Tuerlinckx, & Scherer, 2013). As Stein, Hernandez, and Trabasso (2008) write,

Goals are central to our theory of emotion, because the monitoring of personally significant goals, in terms of their failure and success, set the conditions for the experience and evocation of emotion. The evocation and experience of emotion occur when unexpected changes in personally significant goals are perceived. The episode that surrounds an emotion begins when a precipitating event occurs and alerts a person to some type of change in a personally significant goal. Once a person perceives this change, all cognitive effort is focused on determining the nature of the change and the impact the change will have on personally relevant goals. (p. 575)

Despite its pivotal role in emotion, the goal has not explicitly been included in the literature as a potential target for reappraisal.¹ The work conducted in Chapter 5 demonstrated that, both conceptually and empirically, this distinction between the goal-relevance of the situation, and the goal itself, is a beneficial one to make, in that both situation- and goal-focused reappraisal occurred naturally in individuals' use of reappraisal, and further that the use of each could be predicted through features of the context itself.

¹ Some previous reappraisal work has discussed regulatory goals (Aldao, Sheppes, & Gross, 2015; McRae et al., 2012), which focus on what the individual is trying to achieve by actively regulating their emotion response (e.g., to decrease anxiety or increase happiness), and thus are different to the broader goals referred to in this thesis.

Chapter 5 presented a model that predicted the use of different types of reappraisal, depending on the individual's interpretation, or appraisal, of the present context. This model arose from both a conceptual review of the literature and an empirical analysis of the data collected in the study, and suggested that situation-focused reappraisal was more appropriate to more ambiguous contexts, whereas goal-focused reappraisal is more appropriate to less ambiguous situations. Further, an initial evaluation of the worthiness of the goal appeared to take place. Specifically, if the goal was seen as unworthy, participants were more likely to use goal-focused reappraisal, regardless of the certainty of the outcome. This interpretation of worth could be similar to the concept of 'centrality' (also referred to as 'importance') in the appraisal and coping literature: an evaluation of how central or crucial this goal is for the individual's sense of well-being (Gall & Evans, 1987; Peacock & Wong, 1990). It was also shown that active tactics (agency, practical skills) were utilised more frequently in controllable situations, and passive tactics more frequently in uncontrollable situations. This directly parallels the coping literature, which has theorised and demonstrated that situations appraised as controllable elicit more problem-based coping strategies (Folkman, Lazarus, Dunkel-Schetter, DeLongis, & Gruen, 1986; Pearlin & Schooler, 1978). The parallel between these findings and other literature increases the validity of the findings and helps to integrate this work in a wider theoretical context.

Following on from the two types of reappraisal proposed in Chapter 5, the study in Chapter 6 compared the effect of situation- versus goal-focused reappraisal on individuals' physiological stress response to experimentally induced anxiety. The individuals who were involved in the more cognitively taxing condition (goal-focused reappraisal), experienced a greater anticipatory increase in physiological stress prior to the task, but then less of an increase in stress once the task was underway. Situation-focused reappraisal, however, resulted in much less physiological reactivity. For this experiment, while both types of

reappraisal required a re-evaluation of the anxiety-provoking stimulus, situation-focused reappraisal required less engagement with and evaluation of the significance of the task, relative to goal-focused.

Similarities can be drawn with the distinction that Shiota and Levenson (2012) make between detached reappraisal (thinking about the situation in a detached, unemotional and objective manner) and positive reappraisal (thinking about the positive aspects of the situation). Their work demonstrated that detached reappraisal resulted in lessened physiological reactivity and reduced self-reported affect relative to positive reappraisal, possibly because of the greater cognitive effort involved in thinking about positive aspects of a situation when compared with detaching oneself from the situation. As argued in Chapters 5 and 6, the situation- versus goal-focused reappraisal distinction is independent of Shiota and Levenson's detached versus positive reappraisal, and both detached and positive reappraisal could be achieved through reinterpreting either the situation or the goal (that is, both detached and positive reappraisal are nested within each of situation- and goal-focused reappraisal). In this particular instance, though, the specific instructions in the detached condition are similar to those in the situation-focused condition, and positive reappraisal is similar to goal-focused reappraisal. Thus, the evidence from Shiota and Levenson's study strengthen the argument made here that goal-focused reappraisal is more cognitively taxing, partly because it involves greater engagement with the situation, evidenced by the physiological patterns in Chapter 6.

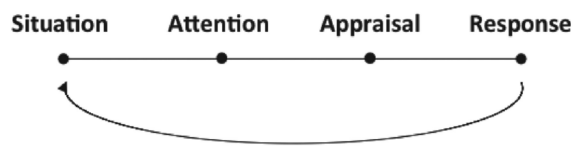
Temporal Considerations

The investigation of reappraisal in this thesis, particularly Chapter 5, was especially novel in its application of reappraisal to real-life, personally-relevant contexts; most research conducted on reappraisal uses emotive experimental stimuli (e.g., photos or film clips) to elicit the emotional response from the participant, but in a way that does not hold particular personal significance for the individual (Goldin, McRae, Ramel, & Gross, 2008; Urry, van

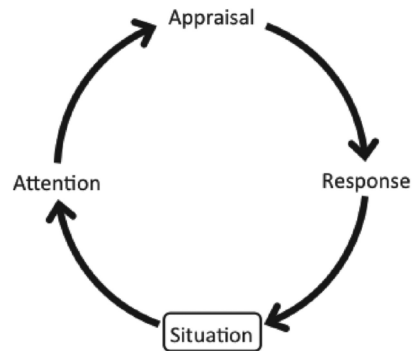
Reekum, Johnstone, & Davidson, 2009; Wolgast, Lundh, & Viborg, 2011). Reappraisal is defined as an antecedent-focused regulatory strategy, in that it alters the interpretation of the emotion-eliciting situation before the emotional response has had a chance to take hold of the individual. As discussed in Chapter 1 (and depicted simply in Figure 1, Panel A, below), the initial interpretation or evaluation of the situation that the individual makes directly affects whether and what emotion is experienced, and the emotion experienced subsequently alters the evaluative process. These components continue to iterate as long as the emotional experience lasts, which can range from seconds to hours, or potentially even longer (see Verduyn, Delaveau, Rotge, Fossati, & Van Mechelen, in press).

While this initial stimulus – appraisal – emotion process is considered strictly linear for the purposes of controlled laboratory studies with experimentally-induced emotions resulting from viewing a picture or a film clip, there is a risk of over-simplifying the interactive, iterative nature of this process that takes place in naturally-occurring, real-life emotional experiences (Ellsworth & Scherer, 2003; Kalisch, 2009). In fact, the complexity of this process has recently been explored in depth by Gross (2015; Ochsner & Gross, 2014) by expanding the traditional model of emotion elicitation (seen in Panel A of Figure 1) to more explicitly represent the iterative nature of this process (Panels B and C).

Panel A



Panel B



Panel C

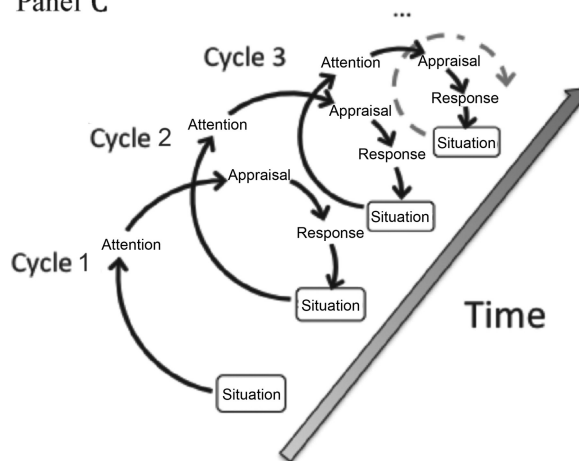


Figure 1. The modal model of emotion in three different forms, from the traditional in Panel A to most complex in Panel C. Reproduced from Gross (2015).

Given this complexity, research needs to take additional factors into account when investigating such complex processes; otherwise, there is a risk of over-simplification. For instance, research is needed to investigate the use and effectiveness of reappraisal that is utilised at some point after this initial appraisal has taken place. Sheppes and Merian have investigated the effects of online reappraisal (reappraisal that takes place directly after the emotion-eliciting stimulus has been initially attended to). Their research has shown that online reappraisal is less beneficial than antecedent reappraisal (Sheppes, Catran, & Meiran,

2009; Sheppes & Meiran, 2007), likely due to the depletion of self-control resources experienced (Sheppes & Meiran, 2008). This research supports the initial proposition of Gross and colleagues that the key to the benefit of reappraisal is its early intervention (e.g., Goldin et al., 2008). However, it is possible that different effects might be found when investigations take place over a longer time period. Many participants' responses in the study in Chapter 5, where individuals were giving reappraisal advice to a fictitious therapy client, recommended the need for the client to acknowledge and 'grieve' the end of the relationship before being able to engage in reappraisal. In this instance, where the kind of emotional experience is much more salient and personally relevant than the emotions elicited by an emotive film clip, the effect of reappraisal might be different. While this was beyond the scope of the studies presented in this thesis, future research should directly investigate this.

TEI, Reappraisal and Stress

Arguably the most novel contribution of this thesis is the profile it provides of how the high TEI individual responds to stressful situations. This work brings together two theoretically similar but largely empirically disconnected areas of psychological research, TEI and emotion regulation, to show how they work together when individuals engage with, and react to, stressful situations (see Peña-Sarrionandia et al., 2015 for a discussion of the links between the emotional intelligence and emotion regulation literatures). The most complete and useful conceptualisation of both emotional intelligence and emotion regulation must prize the importance of *adaptive* understanding of, engagement with, and management of, emotions, which means that the best way to behave in any situation is dependent on its contextual features and the specific aims and desires of the individual at that time (Aldao, 2013; Saklofske et al., 2012; Troy, Shallcross, & Mauss, 2013). A major criticism of TEI is its use of self-report rather than objective measures (Matthews, Roberts, & Zeidner, 2004), but to criticise TEI for this is to misunderstand the core of the construct, that is *self-*

perceptions of emotional abilities, rather than the abilities themselves. As Petrides and Furnham (2003) write, “self-perceptions, it is important to note, need not be accurate to exert influence on behaviour or mental health” (p. 41). The usefulness of the TEI construct is that individuals who believe they have a good understanding of and handle on their emotions seem to also have a better understanding of how to cope with difficult and complex life events, as evidenced by this thesis (particularly chapters 3, 4 and 6) and prior research that has captured more complex interactions between person and environment over time (e.g., Laborde, Brüll, Weber, & Anders, 2011; Mikolajczak et al., 2009; Saklofske et al., 2012), situation-relevant factors (Schutte, Manes, & Malouff, 2009; Sevdalis et al., 2007) and potential explanations for associations (Di Fabio & Saklofske, 2014; Kafetsios & Zarnpetakis, 2008).

In line with this, the work in this thesis has demonstrated that what characterises high TEI individuals’ responses to high-demand situations is not necessarily low stress and anxiety and high well-being all the time. For example, results from Chapter 3 showed that high TEI individuals experienced a greater increase in stress from baseline to the high stress time point, and the same pattern was seen in Chapter 6 when individuals used goal-focused reappraisal. Rather than seeing this response as detrimental for the individual, though, I have argued that instead, high TEI individuals experience an increase in stress to meet the increased demand of the situation (akin to the concept of allostatic load; McEwen, 1998). The results of the longitudinal study in Chapter 3 showed that high TEI individuals both began and ended the high-stress year significantly less stressed and less anxious than their low EI counterparts. However, they experienced a significant increase in stress in the middle of the year, when they were experiencing the greatest demands, making them indistinguishable from the other participants at that time point in terms of their stress. The adaptive interpretation of this result is supported by the fact that their anxiety was consistently lower than their low TEI

counterparts' anxiety at each time point, and did not increase from baseline throughout the year. Thus, this increase in stress appeared adaptive to their coping with the situation.

Further, the increase in stress from baseline was associated with greater use of reappraisal and active coping. As has been discussed, previous research has shown that both reappraisal (Egloff, Schmukle, Burns, & Schwerdtfeger, 2006; Gross, 2002) and active coping (Ben-Zur, 2009; Carver, Scheier, & Weintraub, 1989) protect against increased negative affect in the presence of a stressor. The finding that high TEI students, compared to low, experienced a *greater* increase in stress (while remaining less anxious), and that active coping and reappraisal explained this increase in stress, supports the argument that active coping and reappraisal were used adaptively. In fact, high TEI individuals also used less avoidant coping, which predicted their lack of increased anxiety compared to low TEI individuals. Both reappraisal and active coping require cognitive engagement with the stressor, by interpreting the source of the negative affect differently in the case of reappraisal (Kalisch, 2009), and engaging in practical tasks to deal with the problem for active coping (Carver, Scheier, & Fulford, 2008).

This thesis also suggested that high TEI individuals actively engage with a short-term acute stressor in the experimental study in Chapter 6. The increased physiological reactivity experienced by the goal-focused reappraisal group was exaggerated by TEI: Higher TEI individuals using goal-focused reappraisal experienced an even greater increase in stress before, then a decrease in stress throughout, the task, compared to their low TEI counterparts. In contrast, TEI had no impact on the effect of situation-focused reappraisal on stress response: High TEI individuals were no more or less reactive when using situation-focused reappraisal than their low TEI counterparts. Thus, it was initially more effortful for individuals who have a greater self-perceived insight into and belief in their emotional skills

(that is, high TEI) to engage with, and re-evaluate the importance of, their wider goal, compared to those who have less belief in their own emotional skills and dispositions.

This suggests that the higher TEI individuals have a more realistic idea of what is personally involved in, and the implications of, altering their (in this case, career) goal, and thus that effort is reflected in the increased physiological stress initially. However, once the task began, that arousal decreased. It is likely that high TEI individuals were more capable of switching their attention to the task once it began, rather than continue thinking about the significance of the goal being altered. Cognitive flexibility is an important aspect of psychological health (Kashdan & Rottenberg, 2010), and dispositional flexibility or adaptability is found in most TEI scales, including the TEIQue (see Table 1 in Chapter 1). Further, TEI has been shown to predict superior performance on a range of occupational and academic tasks (see van Rooy & Viswesvaran, 2004). Given the cognitive efforts involved in reappraising their goal, the belief that high TEI individuals had in their ability to focus on the task at hand when it was required resulted in a greater decrease in their physiological arousal, following their prior increase, which was a interesting finding and offers a substantial contribution to the TEI literature.

Limitations and Future Directions

While this thesis is novel in the questions it addressed, there are some acknowledged limitations and additional questions that have arisen as a result of the work conducted, some of which have already been discussed. This section will detail some of the limitations and potential areas for future research to address unanswered questions.

While the relationship between TEI and reappraisal was investigated via multiple approaches, there are still more avenues to explore. TEI is positively related to dispositional use of reappraisal (as was demonstrated in Chapters 3 and 4), and alters the impact of reappraisal (Chapter 6), but it is unknown whether the use of reappraisal varies throughout

stressful periods, and whether high TEI individuals alter their use of reappraisal more than low TEI individuals. Given the exploratory nature of the study in Chapter 3, and the complexity already present in a longitudinal design, I decided not to measure reappraisal repeatedly throughout the year. This could be addressed by instructing participants to complete the dispositional reappraisal measure (the Emotion Regulation Questionnaire; Gross & John, 2003) by thinking of how much they have used reappraisal, for example, over the past week or month. The concept of *adaptive* emotion regulation, which is a fundamental aspect of all TEI theories (as discussed in Chapter 1), posits that individuals know *when* to regulate their emotions and when not to (see Aldao et al., 2015, for a discussion of emotion regulation flexibility). Weber, Loureiro de Assunção, Martin, Westmeyer, and Geisler (2014) found that reappraisal inventiveness (that is, the ability to think up multiple, different types, of reappraisal) was unrelated to typical reappraisal use, arguing for a distinction between reappraisal ability and reappraisal frequency. An additional, related, question that was raised by the work in the thesis, particularly Chapters 5 and 6, is whether high TEI individuals use particular types of reappraisal more often than their low TEI counterparts. Chapter 6 showed the differential effects of situation- versus goal-focused reappraisal as a function of TEI, but did not investigate whether high TEI individuals were better able to use either of these types of reappraisal. Thus, a nuanced understanding of how reappraisal use changes over time, and whether TEI is associated with that change, and the impact of the change, is needed (see also McRae, 2013).

Chapter 5 proposed a model for the use of types of reappraisal depending on situational factors. Preliminary evidence for the model was presented in that chapter, and thus the next step would be to test it more thoroughly. This could be achieved by manipulating features of the context and the individual's goal, then giving participants direct instructions to reappraise either the situation or the goal (via different reappraisal tactics, too), and compare

the efficacy of the reappraisal to decrease the emotional response through a combination of self-reported affect and physiological measures. Additionally, qualitative research (such as the methods used in Chapter 5, or more in-depth interviews) could be utilised to assess what sort of reappraisals individuals would prefer to use in different contexts, and why. A combination of these two approaches would extend the existing work by investigating both the common use of reappraisal (e.g., Suri, Whittaker, & Gross, 2014; Weber et al., 2014) and the most beneficial use of reappraisal (e.g., Kalisch, 2009; Troy et al., 2013).

The methodology utilised in the study in Chapter 5, which asked participants to play the role of therapist and give advice to a client using reappraisal, was appropriate for identifying common or typical ways of using reappraisal, while comparing results across three scenarios that differed on key features (certainty and control) directly allowed specific hypotheses to be tested regarding what kind of reappraisal would be used in what circumstances. However, the nature of the task allowed participants to use multiple kinds of reappraisal together (by offering the client alternative ways of reappraising the problem). While this allowed a comparison of the use of types of reappraisal *between* scenarios, it did not allow a comparison of reappraisal use *within* scenarios, given the lack of independence of multiple reappraisals used in each participant's response. Although this brought about an unexpected finding, namely the propensity for individuals to use multiple types of reappraisal, which generated another interesting avenue to pursue, future work should investigate what situations would lend themselves to the use of multiple reappraisals, and why; and discover any differences in using multiple versus a single type of reappraisal.

Finally, some methodological details limited some of the conclusions that could be made by the work, specifically regarding the ability to separate specific effects. In the longitudinal study presented in Chapter 3, the targeted population being studied meant the sample size of that study was quite small. While this was maximised as best as possible (e.g.

by offering participants multiple incentives to participate, and running the study over two consecutive years to double the number of students included), there was inevitably some dropout due to the longitudinal nature, and the final sample size limited the analyses that could be conducted. Ideally, coping and emotion regulation (reappraisal and suppression) would have been included in the same model, in order to compare their effects (as was done in the cross-sectional study in Chapter 4), but this was not feasible with the small sample size. Further, this study was not able to isolate the unique predictive effect of TEI over and above FFM. While this was not ideal, the discussion earlier in this chapter regarding the limited benefit of FFM factors in predicting changes in distress over time suggests that the TEI results would not have been undermined, thus confirming the predictive utility of TEI. However, future work could demonstrate this more conclusively.

Conclusions

In summary, there were three major findings from the work presented in this thesis. First, while TEI is useful construct, it is not a unified construct: Significant differences exist between TEI measurement tools, exhibiting different associations with different constructs that explain their prediction of psychological health. This is unfortunate, as it limits the strength of the research area if findings cannot be generalised across scales that are assumed to measure the same construct. In particular, it gives rise to inconsistent findings and adds additional, unnecessary variation into the already-complex field (Daus & Ashkanasy, 2003; Mikolajczak, 2009). Second, the emotion regulation strategy of cognitive reappraisal can be engaged by either reinterpreting the relevance of the situation in light of the goal, or by changing the higher-order goal itself. Contextual features determine what type of reappraisal is more likely to be used, and different reactions to an acute stressor are seen depending on what, specifically, individuals reappraise. Finally, and perhaps most crucially, adaptive coping styles best explain the benefit of TEI on cross-sectional stress, but reappraisal best

explains the effect of TEI on reactions to stress. High TEI individuals experience less general stress and anxiety because they engage with stressors practically, rather than avoiding or withdrawing from them. Engaging in reappraisal, and in particular, reappraisal that alters the individual's goal, results in a greater initial increase in stress when faced with a stressor, but can be more beneficial longer term. This demonstrates that cognitively engaging with the stress-inducing situation is more taxing than not, and even more so for those individuals who have greater beliefs in their own emotional abilities. However, doing this can be ultimately more beneficial for the high TEI individual. This work offers a novel and unique contribution to the TEI and reappraisal literatures, and shows that much can be learnt by considering the intricacies of how they work together.

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Appendix A: Supplementary Material from Chapter 2.

Table 1

Descriptive information of studies included in the meta-analysis

Study	N	TEI scale ^a	FFM factor	FFM scale	Sample
Ali et al. (2012)	310	AES	N, E, O, A, C	NEO-FFI	Org
Ann & Yang (2012)	442	WLEIS	E, A	NEO-FFI	Univ
Augusto Landa et al. (2010)	228	TMMS*	N, E, O, A, C	NEO-FFI	Univ
Austin et al. (2005)	55-62	EQ-i-S*, AES	N, E, O, A, C	NEO-FFI	UC
Austin et al. (2005)	174-187	EQ-i-S*	N, E, O, A, C	Mini-markers	UC
Austin et al. (2005)	285-291	AES	N, E, O, A, C	Mini-markers	UC
Austin et al. (2007)	198	EQ-i-S*	N, E, O, A, C	IPIP	Univ
Austin et al. (2007)	341	TEIQue-SF	N, E, O, A, C	IPIP	UC
Austin et al. (2008)	247	TEIQue-SF	N, E, O, A, C	IPIP	Univ
Austin et al. (2010)	475	EQ-i-S*	N, E, O, A, C	Mini-markers	Univ
Bastian et al. (2005)	246	TMMS*	N, E, O, A, C	NEO-PI-R	Univ
Brackett & Mayer (2003)	188	AES, EQ-i	N, E, O, A, C	NEO-PI-R	Univ
Brackett et al. (2006)	316	SREIS	N, E, O, A, C	NEO-PI-R	Univ
Brannick et al. (2009)	130	WLEIS*,	N, E, O, A, C	NEO-PI-R	Univ
Cavazotte et al. (2012)	134	WLEIS	N, E, O, A, C	IPIP	Org
Chamorro-Premuzic et al. (2007)	112	TEIQue-SF	ES, E, O, A, C	TIPI	UC
Chamorro-Premuzic et al. (2012)	535	TEIQue-SF	N, E, O	IPIP	UC
Côté et al. (2010)	136	AES	ES, E, O, A, C	IPIP	Univ
Davies et al. (1998)	100	TMMS*	epq-r-e, epq-r-n	EPQ-R	Univ
Davies et al. (1998)	131	TMMS	N, E, O, A, C	T-S D I	Univ
Dawda & Hart (2000)	243	EQ-i*	N, E, O, A, C	NEO-FFI	Univ
Day et al. (2005)	114	EQ-i*	N, E, O, A, C	NEO-FFI	Univ
Di Fabio & Palazzeschi (2012)	384	EQ-i*	epq-n, epq-e	EPQ-RS	Org

Study	N	TEI scale ^a	FFM factor	FFM scale	Sample
Di Fabio et al. (2012)	232	EQ-i-S*	ES, E, O, A, C	BFQ	Univ
Di Fabio et al. (2013)	361	EQ-i	ES, E, O, A, C	BFQ	Univ
Douglas et al. (2004)	205	EQ-i	C	NEO-PI	Univ
Downey et al. (2011)	100	SUEIT*	N, E, O, A, C	NEO-FFI	Org
Engelberg & Sjoberg (2004)	282	AES	ES	FFPI	Univ
Extremera & Fernández-Berrocal (2005)	160	TMMS*	N, E, O, A, C	BFI	Univ
Ferguson & Austin (2010)	97	TEIQue-SF	O, A	IPIP	Univ
Freudenthaler et al. (2008)	150	TEIQue*	N, E, O, A, C	NEO-FFI	Univ
Gallagher & Vella-Brodrick (2008)	260	AES	ES, E, A, C, I	IPIP	Comm
Gannon & Ranzjin (2005)	187	SUEIT*	N, E, O, A, C	NEO-FFI	Comm
Greven et al. (2008)	1038	TEIQue*	N, E, O, A, C	BFI	Univ
Grubb & McDaniel (2007)	229	EQ-i-S*	ES, E, O, A, C	IPIP	Univ
James et al. (2012)	150	WLEIS	N, E, O, A, C	IPIP	Univ
Johnson et al. (2009)	328	TEIQue-SF	ES, E, O, A, C	Mini-markers	Univ
Kampfe & Mitte (2010)	467	TMMS*	N, E	NEO-FFI	Univ
Kampfe & Mitte (2010)	348	TMMS*	N, E	NEO-FFI	Univ
Kim & Argusa (2011)	385	WLEIS	N, E	IPIP	Org
Kluemper (2008)	180	WLEIS	N, E, O, A, C	NEO-FFI	Org
Koydemir & Schütz (2012)	101	AES	N, E, O, A, C	BFI-44	Univ
Koydemir & Schütz (2012)	86	AES	N, E, O, A, C	BFI-44	Univ
Law et al. (2004)	418	WLEIS*, TMMS*	N, E, O, A, C	NEO-PI	Univ
Law et al. (2004)	314	WLEIS	N, E, O, A, C	ARS	Univ
Livingstone & Day (2005)	211	EQ-i*	PCI-s, PCI-e, PCI-o, PCI-a, PCI-c	PCI	Org
McIntyre (2010)	420	EQ-i*	N, E, O, A, C	A S-D Q	Univ
Mikolajczak et al. (2007)	80	TEIQue*	ES, In, O, A, C	D5D	UC

Study	N	TEI scale ^a	FFM factor	FFM scale	Sample
Newsome et al. (2000)	137	EQ-i*	16PF-e, 16PF-a, 16PF-t, 16PF-i, 16PF-s	16PF	Univ
O'Connor Jr. & Little (2003)	90	EQ-i*	16PF-e, 16PF-a, 16PF-t, 16PF-i, 16PF-s	16PF	Univ
Petrides & Furnham (2001)	166	EQ-i	N, E, O, A, C	NEO-PI-R	Univ
Petrides & Furnham (2003)	30	TEIQue	N, E, O, A, C	NEO-PI-R	Univ
Petrides et al. (2007)	274	TEIQue	N, E, O, A, C, epq-e, epq-n	TEXAP, EPQ	Univ
Reid (2007)	103	AES, TMMS*,	N, E, O, A, C	OCEANIC	Univ
Reid (2007)	115	TEIQue-SF	N, E, O, A, C	Mini-markers	Univ
Reid (2007)	71	EQ-i, TEIQue-SF	N, E, O, A, C	Mini-markers	Org
Reid (2007)	149	EQ-i, TEIQue-SF	N, E, O, A, C	Mini-markers	Org
Saklofske et al. (2003)	103	AES	N, E, O, A, C	NEO-FFI	Univ
Saklofske, Austin, Galloway et al. (2007)	360	AES	N, E, O, A, C	Mini-markers	Univ
Saklofske, Austin, Rohr et al. (2007)	497	EQ-i-S*	N, E, O, A, C	Mini-markers	Univ
Saklofske et al. (2012)	216	EQ-i-S*	N, E, O, A, C	Mini-markers	Univ
Schutte et al. (1998)	23	AES	N, E, O, A, C	NEO-PI-R	Univ
Shi & Wang (2007)	1458	WLEIS*	N, E, O, A, C	BFA-m	Univ
Siegling et al. (2013)	644	TEIQue-SF	N, E, O, A, C	BFI	Univ
Singh & Woods (2008)	523	TEIQue-SF	N, E, C	BFI	Comm
Sy et al. (2006)	187	WLEIS	N, E, O, A, C	BFI	Org
Vakola et al. (2004)	137	EQ*	N, E, O, A, C	TPQue5	Org
van Rooy et al. (2005)	199	AES	ES, E, O, A, C	IPIP	Univ
Warwick & Nettlebank (2004)	84	TMMS*,	N, E, O, A, C	NEO-FFI	Univ

Notes. ^a * use of scale subscales. N = neuroticism. E = extraversion. O = openness to experience. A = agreeableness. C = conscientiousness. I = intelligence/intellectual curiosity. ES = emotional stability. In = introversion. epq-e = Eysenk's

Personality Questionnaire – extraversion. epq-n = Eysenk's Personality Questionnaire – neuroticism. 16PF-n = 16PF neuroticism.
 16PF-a = 16PF anxiety. 16PF-t = 16PF tough-mindedness. 16PF-i = 16PF independence. 16PF-s = 16PF self-control. PCI-s = PCI
 stability. PCI-o = PCI openness to experience. PCI-e = PCI extraversion. PCI-c = PCI conscientiousness. PCI-a = PCI-
 agreeableness. TEXAP = Traits Personality Questionnaire. D5D = Description in Five Dimensions system. T-S D I = Trait-Self
 Description Inventory. TPQue5 = Traits Personality Questionnaire 5. ARS = NEOAC adjective rating scale. Mini-markers =
 Personality mini-markers. PCI = Personal Characteristics Inventory. FFPI = Five Factor Personality Inventory. IPIP = International
 Personality Item Pool. BFI = Big Five Inventory. BFA-m = Big Five Adjective scale (modified). TIPI = Ten Item Personality
 Inventory. OCEANIC = Openness Conscientiousness Extraversion Agreeableness Neuroticism Index Condensed 60-item version.
 Univ = University (college) students (undergraduate and/or postgraduate). Org = organisational employees. Comm = Community
 sample. UC = Combined university students and community sample.

Table 2

Pooled estimates and deviations for each TEI subscale

Scale	<i>k</i>	Pooled estimate		Heterogeneity <i>p</i>	Bias <i>p</i>
		<i>r</i>	95% CI		
N					
TEIQue-Em	3	-.237*	[-.582, -.108]	.039	.437
TEIQue-SC	3	-.667*	[-.719, -.615]	.607	.120
TEIQue-WB	3	-.595	[-1.042, -.147]	.011	.880
TEIQue-Soc	3	-.381	[-.941, .178]	.001	.871
EQ-i-Intra	15	-.421	[-.550, -.292]	<.001	.041
EQ-i-Inter	15	-.186**	[-.242, -.130]	.008	.177
EQ-i-Mood	15	-.542**	[-.645, -.439]	<.001	.192
EQ-i-Adapt	14	-.316	[-.463, -.170]	<.001	.032
EQ-i-Stress	13	-.522*	[-.686, -.358]	<.001	.275
TMMS-Rep	9	-.403**	[-.537, -.269]	<.001	.784
TMMS-Att	9	-.087**	[-.036, .209]	<.001	.124
TMMS-CI	9	-.358*	[-.418, -.289]	.252	.844
WLEIS-UoE	4	-.316	[-.496, -.142]	.004	.678
WLEIS-SEA	4	-.179	[-.749, .391]	<.001	.065
WLEIS-OEA	4	-.191	[-.509, .126]	<.001	.254
WLEIS-RoE	4	-.343	[-.663, -.022]	<.001	.104
EIQ-Con ^a	1	-.788	[-.957, -.619]		
EIQ-Per ^a	1	-.076	[-.245, .093]		
EIQ-Und ^a	1	-.051	[-.220, .118]		
EIQ-Use ^a	1	-.669	[-.838, -.500]		
SUEIT-EC ^b	2	-.631*	[-.643, -.613]	.924	
SUEIT-EDC ^b	2	.070*	[-.281, .421]	.004	
SUEIT-EM ^b	2	-.648*	[-.679, -.618]	.805	
SUEIT-ERX ^b	2	-.045*	[-.410, .320]	.003	
SUEIT-UEX ^b	2	-.222	[-.324, -.119]	.403	
E					
TEIQue-Em	3	.404	[.023, .786]	.027	.546
TEIQue-SC	3	.102*	[-.059, .262]	.238	.380
TEIQue-WB	3	.472	[.126, .819]	.042	.552
TEIQue-Soc	3	.555	[.188, .923]	.013	.072
EQ-i-Intra	15	.463	[.387, .539]	<.001	.960
EQ-i-Inter	15	.360**	[.296, .424]	<.001	.568
EQ-i-Mood	15	.428**	[.343, .513]	<.001	.488
EQ-i-Adapt	14	.134**	[.052, .216]	<.001	.025
EQ-i-Stress	13	.074**	[-.005, .152]	<.001	.016
TMMS-Rep	9	.387**	[.223, .550]	<.001	.300
TMMS-Att	9	.228	[.131, .325]	<.001	.460
TMMS-CI	9	.219	[.155, .283]	.117	.289
WLEIS-UoE	4	.093	[-.177, .364]	<.001	.080
WLEIS-SEA	4	.082	[-.117, .282]	<.001	.161
WLEIS-OEA	4	.077	[-.291, .446]	<.001	.024
WLEIS-RoE	4	.034	[-.063, .132]	.785	.790
EIQ-Con ^a	1	.215	[.046, .384]		

Scale	<i>k</i>	Pooled estimate		Heterogeneity <i>p</i>	Bias <i>p</i>
		<i>r</i>	95% CI		
EQ-Per ^a	1	.399	[.230, .568]		
EQ-Und ^a	1	.412	[.243, .581]		
EQ-Use ^a	1	.593	[.424, .762]		
SUEIT-EC ^b	2	.176	[-.044, .397]	.073	
SUEIT-EDC ^b	2	.190	[.039, .342]	.217	
SUEIT-EM ^b	2	.466*	[.401, .531]	.599	
SUEIT-ERX ^b	2	.332	[.240, .423]	.459	
SUEIT-UEX ^b	2	.328	[.308, .349]	.867	
C					
TEIQue-Em	3	.318	[-.213, .849]	.736	.859
TEIQue-SC	3	.382	[-.128, .892]	.648	-.388
TEIQue-WB	3	.343	[.263, .424]	.337	.665
TEIQue-Soc	3	.315	[.131, .498]	.232	.594
EQ-i-Intra	14	.290	[.221, .359]	.001	.348
EQ-i-Inter	14	.227*	[.167, .288]	.004	.891
EQ-i-Mood	14	.220	[.142, .299]	<.001	.516
EQ-i-Adapt	13	.355**	[.269, .442]	<.001	.870
EQ-i-Stress	12	.285	[.214, .356]	.009	.737
TMMS-Rep	6	.142	[.063, .221]	.301	.188
TMMS-Att	6	.050**	[.034, .067]	.740	.770
TMMS-CI	6	.228**	[.106, .350]	.008	.246
WLEIS-UoE	4	.396*	[.228, .510]	.006	.135
WLEIS-SEA	4	.262	[.151, .374]	.063	.046
WLEIS-OEA	4	.275	[.133, .418]	.001	.160
WLEIS-RoE	4	.203	[.015, .390]	<.001	.188
EQ-Con ^a	1	.433	[.264, .602]		
EQ-Per ^a	1	.387	[.218, .556]		
EQ-Und ^a	1	.393	[.224, .562]		
EQ-Use ^a	1	.493	[.324, .662]		
SUEIT-EC ^b	2	.259	[.144, .446]	.220	
SUEIT-EDC ^b	2	-.002	[-.223, .218]	.073	
SUEIT-EM ^b	2	.339	[.239, .439]	.416	
SUEIT-ERX ^b	2	.174	[.159, .188]	.905	
SUEIT-UEX ^b	2	.280	[.102, .457]	.149	
O					
TEIQue-Em	3	.340	[.155, .526]	.789	.436
TEIQue-SC	3	.079**	[-.332, .490]	.806	.690
TEIQue-WB	3	.264	[.014, .515]	.113	.671
TEIQue-Soc	3	.341**	[-.372, 1.055]	.492	.731
EQ-i-Intra	14	.230**	[.160, .300]	<.001	.393
EQ-i-Inter	14	.174	[.122, .227]	.080	.425
EQ-i-Mood	14	.135	[.048, .222]	<.001	.307
EQ-i-Adapt	13	.176	[.093, .260]	<.001	.301
EQ-i-Stress	12	.027**	[-.050, .104]	.001	.518
TMMS-Rep	6	.147	[-.005, .299]	.001	.456
TMMS-Att	6	.184	[-.080, .447]	<.001	.776
TMMS-CI	6	.134	[-.001, .268]	.010	.851
WLEIS-UoE	4	.180	[.078, .282]	.216	.256

Scale	<i>k</i>	Pooled estimate		Heterogeneity <i>p</i>	Bias <i>p</i>
		<i>r</i>	95% CI		
WLEIS-SEA	4	.141	[.110, .171]	.572	.199
WLEIS-OEA	4	.158	[.095, .222]	.406	.047
WLEIS-RoE	4	.058	[-.172, .289]	<.001	.325
EIQ-Con ^a	1	.051	[-.118, .220]		
EIQ-Per ^a	1	.237	[.068, .406]		
EIQ-Und ^a	1	.312	[.143, .481]		
EIQ-Use ^a	1	.064	[-.105, .233]		
SUEIT-EC ^b	2	.170	[.154, .186]	.899	
SUEIT-EDC ^b	2	.241	[-.035, .517]	.025	
SUEIT-EM ^b	2	.238	[.231, .244]	.956	
SUEIT-ERX ^b	2	.270	[.141, .399]	.293	
SUEIT-UEX ^b	2	.288	[.187, .388]	.412	
A					
TEIQue-Em	3	.414	[.152, .677]	.095	.115
TEIQue-SC	3	.284	[-.046, .615]	.024	.514
TEIQue-WB	3	.358	[.290, .426]	.360	.903
TEIQue-Soc	3	.045**	[-.759, .849]	.549	.982
EQ-Intra	14	.226	[.157, .295]	.001	.244
EQ-i-Inter	14	.530**	[.387, .672]	<.001	-.206
EQ-i-Mood	14	.311	[.256, .367]	.036	.103
EQi-Adapt	13	.196**	[.116, .275]	<.001	.042
EQ-i-Stress	12	.296	[.207, .385]	<.001	.505
TMMS-Rep	6	.260	[.120, .400]	.004	.707
TMMS-Att	6	.169	[-.005, .343]	<.001	.805
TMMS-CI	6	.167	[.085, .250]	.796	.890
WLEIS-UoE	4	.095	[-.018, .207]	.045	.395
WLEIS-SEA	4	.106	[-.029, .241]	.018	.080
WLEIS-OEA	4	.172	[-.061, .405]	<.001	.786
WLEIS-RoE	4	.143	[.033, .253]	.014	.742
EIQ-Con ^a	1	.160	[-.009, .329]		
EIQ-Per ^a	1	.323	[.154, .492]		
EIQ-Und ^a	1	.415	[.246, .584]		
EIQ-Use ^a	1	.293	[.124, .462]		
SUEIT-EC ^b	2	.062	[-.108, .231]	.168	
SUEIT-EDC ^b	2	.102	[-.193, .396]	.016	
SUEIT-EM ^b	2	.043	[-.182, .268]	.067	
SUEIT-ERX ^b	2	.104	[.012, .196]	.454	
SUEIT-UEX ^b	2	.130	[.083, .177]	.702	

Note. * $p < .05$. ** $p < .01$. k = number of included correlations. r = pooled correlation.

^a EIQ results are based on the correlation and confidence interval from the single published study. Heterogeneity and bias statistics could not be computed. ^b SUEIT results are based on two published studies, thus bias statistics could not be computed.

Appendix B: Supplementary Material from Chapter 3.

Table 1

Correlations between predictors and outcomes

Predictors	Stress			Anxiety		
	Time 1	Time 2	Time 3	Time 1	Time 2	Time 3
Neuroticism	.648**	.475**	.550**	.536**	.536**	.433**
Agreeableness	-.291**	-.083	-.302*	-.237*	-.246*	-.262**
Extraversion	-.118	.063	-.161	-.112	-.089	-.055
Conscientiousness	-.150	-.097	-.109	-.120	-.107	-.094
Openness	-.164	-.041	.060	-.017	-.036	.031
Reappraisal	-.246*	.020	-.236*	-.226*	-.199	-.154
Rumination	.539**	.389**	.427**	.501**	.486*	.358**
Suppression	.080	-.005	-.062	-.098	.068	-.017
Active coping 1	-.136	.016	-.176*	-.141	-.136	-.072
Avoidant coping 1	.297**	.155	.131	.333**	.320**	.107
Active coping 2	--	-.103	-.085	--	-.207	-.022
Avoidant coping 2	--	.215	.273*	--	.413**	.235*
Active coping 3	--	--	-.163	--	--	-.091
Avoidant coping 3	--	--	.298**	--	--	.239*

Note. Correlations with each predictor are only reported for outcomes at the same or a

subsequent time point. * $p < .05$. ** $p < .01$

Appendix C: Corrected Proof of the Manuscript in Chapter 4.

Reference:

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Predicting distress via emotion regulation and coping: Measurement variance in trait EI scales[☆]

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ABSTRACT

High trait emotional intelligence (TEI) is negatively associated with psychological distress, and researchers have been investigating the roles of emotion regulation strategies and coping styles in this association. However, a confusing variety of TEI scales are in use, and studies suggest that systematic differences may exist between them. Thus, the aim of this study was to examine the extent to which coping styles and emotion regulation strategies (reappraisal and suppression) explain the TEI–distress association using three TEI scales: the Trait Emotional Intelligence Questionnaire (TEIQue), the Assessing Emotions Scale (AES) and the Wong and Law Emotional Intelligence Scale (WLEIS). Participants ($N = 423$) were recruited online (59% resided in India, 36% the USA, 5% elsewhere). Structural equation modelling showed that both the TEIQue and AES negatively predicted distress, mostly via avoidant coping, and with a stronger direct TEI–distress path in the TEIQue model. In contrast, the WLEIS showed a weaker overall relationship with distress, but a greater number of indirect paths (i.e., negatively predicting distress via less avoidant coping and more reappraisal; positively predicting distress via more suppression and religious coping). Implications of the use of different TEI scales in clinical research are discussed.

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1. Introduction

Empirical studies have reliably demonstrated that high trait emotional intelligence (TEI) is associated with lower stress and anxiety (Palmer, Donaldson, & Stough, 2002). Some work has suggested that this may be due to high TEI individuals' use of adaptive coping styles (Austin, Saklofske, & Mastoras, 2010). Various kinds of emotion regulation strategies (ER) have also been associated with TEI (Schutte, Manes, & Malouff, 2009), and explain differences in distress in their own right. To date, however, no research has investigated the extent to which both coping and ER might explain the TEI–distress link. Further, recent work has shown systematic differences in TEI measurement tools, which suggests that different scales might not be measuring the same construct (Beath, Jones, & Fitness, 2014a). Thus, the aims of the current study were to examine the extent to which coping styles and ER strategies might explain the TEI–distress link, using three, different, TEI scales. Variation in the findings across scales would imply that they might be tapping into different mechanisms to protect against distress, pro-

viding evidence in turn for heterogeneity in the adaptive features of TEI.

1.1. TEI and psychological distress

TEI is a constellation of emotion-related dispositions and self-perceptions (Petrides, Furnham, & Frederickson, 2004). A number of studies have explored the predictive utility of TEI in relation to psychological distress (van Heck & den Ouden, 2008; Zeidner, Matthews, & Roberts, 2012), with a recent meta-analysis reporting the average correlation between TEI and mental health to be $r = .36$ (Martins, Ramalho, & Morin, 2010). Given that TEI assesses general emotional dispositions, we argue that the mechanism through which this relationship works is via more proximal behaviours and dispositions such as coping styles and ER strategies. Coping styles comprise a range of individual dispositions to behave in response to stressful situations (Carver, Scheier, & Weintraub, 1989), with high TEI individuals more likely to use active, problem-focused behaviours and less likely to use avoidant behaviours than low TEI individuals (Saklofske, Austin, Mastoras, Beaton, & Osborne, 2012). Different ER strategies are also associated with TEI; in particular, suppression and reappraisal. Suppression (a generally maladaptive strategy) refers to the act of inhibiting external emotional displays; reappraisal (a generally adaptive strategy)

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involves altering the interpretation of the emotion-eliciting event in order to change the emotional experience (Gross & John, 2003). Suppression and reappraisal have been negatively and positively linked to TEI, respectively (Schutte et al., 2009). However, different TEI scales are differentially associated with these constructs, suggesting that they may each be measuring different facets of TEI. Specific associations between different TEI scales and both coping and ER strategies are reviewed below.

1.2. TEI scales

There are a number of distinct TEI measures in use, and while correlations between them vary, they are generally lower than would be expected if all scales were assessing the same construct (e.g., Austin, Saklofske, & Egan, 2005). A recent meta-analysis of associations between various TEI scales and the five factor model of personality (FFM, consistently associated with TEI) suggested that the scales could be grouped into three categories (Beath et al., 2014a): TEI scales with the strongest correlations with personality (the Trait Emotional Intelligence Questionnaire, TEIQue; Petrides, 2009; and the Emotional Quotient Inventory, EQ-i; Bar-On, 1997); scales with the weakest correlations (Wong and Law Emotional Intelligence Scale, WLEIS; Law, Wong, & Song, 2004; and the Swinburne University Emotional Intelligence Test, SUEIT; Palmer & Stough, 2001); and scales with moderate correlations (e.g., the Assessing Emotions Scale, AES; Schutte et al., 1998). This systematic variation in correlations between TEI scales and personality suggests that these instruments are tapping into different aspects of the TEI construct. In the present study, we aimed to ensure that our findings in relation to the mechanisms underpinning the relationship between TEI and psychological distress would be generalizable and not simply reflective of one aspect of TEI; thus, we selected the most widely used scale from each of these three groups: the TEIQue, AES and WLEIS. These three scales differ in their conceptual backgrounds, which further suggests that they might be tapping into different sub-constructs of TEI.

1.2.1. AES

The Assessing Emotions Scale (Schutte et al., 1998, also referred to as the SEIS) was designed to measure EI in line with Mayer and Salovey's (1997) ability framework, which conceptualises emotional intelligence as a set of objective, demonstrable skills. The AES measures self-perceptions of emotional ability, emotion regulation, and emotional utilisation in the individual and others. While there was no factor structure originally proposed for the scale, some researchers have found four underlying factors (e.g., Saklofske, Austin, & Minski, 2003). Significant low to moderate associations between the AES and each FFM trait have been obtained (e.g., Bastian, Burns, & Nettelbeck, 2005; Koydemir & Schütz, 2012). The average correlation between the AES and mental health is reported as $r = .28$ (Martins et al., 2010). The AES has been positively associated with planning-focused coping (Por, Barriball, Fitzpatrick, & Roberts, 2011) and negatively associated with ruminative, emotional coping (Saklofske, Austin, Galloway, & Davidson, 2007). Finally, this scale has been moderately correlated with greater reported use of reappraisal and less suppression (Schutte et al., 2009).

1.2.2. WLEIS

The Wong and Law Emotional Intelligence Scale (WLEIS; Wong & Law, 2002) was also developed according to Mayer and Salovey's (1997) framework, originally for use in organisational contexts. Unlike the AES, WLEIS items formally comprise four factors: self-emotion appraisal, other-emotion appraisal, use of emotion and emotion regulation. While the authors intended the WLEIS to be empirically distinct from FFM traits, correlations range from .37

to .52 (James, Bore, & Zito, 2012), and tend to show slightly stronger associations than the AES. Only one study that used the WLEIS was included in Martins et al.'s (2010) meta-analysis, with a reported correlation of .24 with mental health. WLEIS-scored TEI has also been associated with adaptive coping styles (Nizielski, Hallum, Schutz, & Lopes, 2013). We are unaware of any investigated associations between the WLEIS and reappraisal or suppression, though given their conceptual similarity, we expected associations akin to the AES.

1.2.3. TEIQue

In contrast to the AES and WLEIS, the Trait Emotional Intelligence Questionnaire (TEIQue; Petrides, 2009) was not solely based on ability models of EI but rather was derived from a broader analysis of the sampling domain of TEI from analysis of the EI literature (Petrides & Furnham, 2001), and the location of TEI in personality factor space, specifically at the lower levels of the personality hierarchy (Petrides, Pita, & Kokkinaki, 2007). While the TEIQue does include factors similar to the AES and WLEIS (emotional expression, perception and management), it also includes broader dispositions such as happiness, self-esteem, and stress management. Accordingly, correlations between FFM traits and the TEIQue are generally larger in magnitude than for the other two scales (correlations between the TEIQue and extraversion and neuroticism have been as strong as $r = .52$ and $-.67$, respectively; Siegling, Vesely, & Saklofske, 2013). Martins et al.'s (2010) meta-analysis reports an average correlation between the TEIQue and mental health as .53, stronger than both the AES and WLEIS. Associations with coping styles are also generally stronger than with the previous two scales (e.g., Petrides et al., 2007). Finally, a recent study found that TEIQue-measured TEI was positively and negatively correlated with reappraisal and suppression respectively, and that reappraisal explained the relationship between TEIQue scores and stress responses (Beath, Jones, & Fitness, 2014b).

1.3. Aims of the current study

In summary, the current study set out to identify whether coping and ER can explain some or all of the association between TEI and psychological distress, but importantly, to test this individually for three TEI scales: the TEIQue, AES and WLEIS. Given that all three TEI scales correlate with the FFM, and given that these traits predict mental health in their own right (e.g., Hagger, 2009), it was considered important to include personality in the study. Thus, we proposed the model depicted in Fig. 1. (Only adaptive coping is shown here for simplicity, but multiple coping styles were assessed.) Given that the AES and WLEIS are both based on the same theoretical model and have shown similar associations with distress and personality, we hypothesised that:

H1. All three TEI scales would be positively related to extraversion, agreeableness, conscientiousness, openness to experience and low neuroticism, with the strongest associations for the TEIQue, and weaker associations for the AES and WLEIS.

Given the associations between each TEI scale and mental health reported in Martins et al. (2010), we hypothesised that:

H2. Compared to the AES and WLEIS, the TEIQue would more strongly predict lower psychological distress.

Finally, given H2 and previous work that has specifically investigated the TEIQue, reappraisal, and psychological distress (Beath et al., 2014b), we hypothesised that:

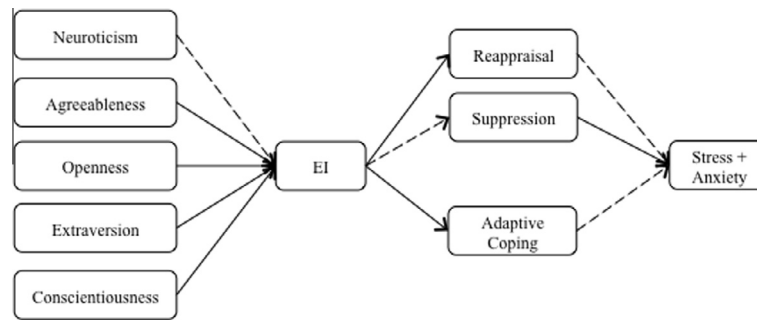


Fig. 1. Hypothesised model. Long dashed lines represent negative hypothesised paths.

H3. Coping, reappraisal and suppression would explain the association between each TEI scale and distress, with reappraisal more directly featuring in the TEIQue model, as seen in Fig. 1.

2. Method

2.1. Participants

Participants were recruited via Amazon's Mechanical Turk online marketplace (Mturk; <https://www.mturk.com/mturk/welcome>), where the study was advertised to potential participants who chose to complete the 45-min survey in exchange for US\$1.00. Mturk has become an increasingly common source of online recruitment, and samples have been shown to be comparable to those recruited via other online methods (Mason & Suri, 2012) and a reliable source of participants for scientific research (Goodman, Cryder, & Cheema, 2013). There is no geographic restriction for individuals to participate in Mturk projects, so a prerequisite for participation in the current study was fluent English ability. 423 participants signed up to complete the survey online, ranging from 18 to 68 years of age ($M = 32.25$, $SD = 10.22$) (see Table 1). This demographic profile is generally consistent with other research using samples recruited through Mturk, though with a slightly lower proportion of Americans than some previous research has reported (e.g., Buhrmester, Kwang, & Gosling, 2011).

2.2. Measures

2.2.1. FFM

International Personality Item Pool items (Goldberg et al., 2006), based on the NEO-PI-R, 10 per factor, measured neuroticism (e.g., "I often feel blue"), extraversion (e.g., "I make friends easily"), agreeableness (e.g., "I make people feel at ease"), openness to experience (e.g., "I enjoy hearing new ideas") and conscientiousness (e.g., "I make plans and stick to them"). Responses were rated on 5-point scales (very inaccurate to very accurate).

2.2.2. Coping

We utilised the Brief COPE (Carver, 1997) with 26 items forming 13 subscales (due to a technical issue, responses for the 14th subscale, self-blame, were not recorded). Instructions asked participants to respond according to what they generally do and feel when experiencing stressful or difficult events (see all items in Supplementary material Table 2.) While Carver reported satisfactory reliabilities for Brief COPE subscales, a number of subscales had lower than satisfactory reliabilities in the current study (i.e., acceptance Cronbach's $\alpha = .464$; self distraction $\alpha = .379$). Since this indicates that the nominal domain structure did not apply well in the current sample, we used a two-stage factor analysis strategy to adapt the Brief COPE to the current context (see Supplementary material for full description of methods and results), which

Table 1
Sample demographics.

Criteria	n (%)
<i>Gender</i>	
Male	235 (56)
Female	188 (44)
<i>Location of residence</i>	
India	249 (59)
USA	154 (36)
Other	20 (5)
<i>Nationality</i>	
Indian	254 (60)
American	144 (34)
Other	25 (6)
<i>Native language</i>	
English	270 (63)
Tamil	72 (17)
Other Indian	61 (14)
Other non-Indian	20 (5)
<i>Highest educational attainment</i>	
Bachelor's degree	205 (48)
Post-graduate degree	93 (22)
Diploma	71 (17)
High school completion	42 (10)
Doctorate	7 (2)
Did not complete high school	5 (1)

Note: $N = 423$.

resulted in five coping factors with much improved scale reliabilities: avoidant ($\alpha = .853$), active ($\alpha = .792$), social ($\alpha = .773$), religious ($\alpha = .743$) and humour coping ($\alpha = .899$).

2.2.3. ER

The Emotion Regulation Questionnaire (Gross & John, 2003), a reliable and valid measure of how individuals typically regulate their emotions, was used to assess reappraisal (six items, e.g., "When I want to feel less negative emotion, I change the way I am thinking about the situation") and suppression (four items, e.g., "I control my emotions by not expressing them"). Responses were recorded on 7-point scales (strongly disagree to strongly agree).

2.2.4. TEI

Three TEI scales were used: first, a 41-item modified version of the AES (e.g., "Other people find it easy to confide in me"; Austin, Saklofske, Huang, & McKenney, 2004), which has stronger psychometric properties than the original, answered using 5-point response scales (completely disagree to completely agree); second, the 16-item WLEIS (e.g., "I am sensitive to the feelings and emotions of others"; Law et al., 2004), answered on 7-point response scales; and third, the 30-item TEIQue – short form (e.g., "On the whole, I am able to deal with stress"; Petrides, 2009), answered

on 7-point response scales. We used the short form of the TEIQue rather than the full 153-item scale to minimise the length of the survey.

2.2.5. Distress

Psychological distress was measured with the stress and anxiety subscales of the Depression, Anxiety and Stress Scale (DASS; Lovibond & Lovibond, 1995) using the stress (assessing nonspecific nervous arousal; e.g. “I found myself getting upset by quite trivial things”) and anxiety (assessing specific physiological and affective arousal; e.g., “I was aware of the dryness of my mouth”) subscales. Each subscale comprised 14 items rated on 4-point scales (“did not apply to me at all” to “applied to me very much, or most of the time”). Instructions asked participants to respond based on how they had been feeling during the previous week.

3. Results

3.1. Correlations

Descriptive correlations are reported in Table 2. While significant positive correlations were found among all three TEI scales, stronger correlations were found between the TEIQue and AES than with the WLEIS, contrary to expectations. Similar patterns of correlations with other variables were found for each TEI scale, with a few exceptions. As expected, the TEIQue correlated more strongly than the other scales with personality. The TEIQue and AES correlated positively with reappraisal and negatively with suppression, but unexpectedly, the WLEIS correlated positively with suppression. Avoidant, social, humour and religious coping were

all positively correlated with stress and anxiety, but unexpectedly, no associations were found between positive coping and stress and anxiety. Stress and anxiety showed similar correlations with the other variables and were highly inter-correlated; hence, a latent variable of ‘distress’ that combined these two measures was used in the SEMs.

3.2. SEMs

The study's hypotheses were assessed via structural equation models (SEMs) that represented the hypothesised model (Fig. 1) using Mplus v.7 (Muthén & Muthén, 1998–2012). All variables except the TEI scale were kept consistent across all SEMs. As the assumption of multivariate normality was violated by the data, standard errors were derived via the nonparametric bootstrap (2000 resamples). SEMs were fitted for each TEI scale and hypotheses were tested using model fit indices and path coefficients, plus comparisons of direct and indirect effects in the SEMs. Standardised path coefficients, 95% confidence intervals and model fit indices are reported for all SEMs. Initially, all coping factors were included in the models, but active coping was not significantly related to distress, and social and humour coping were not significantly related to any of the TEI scales. Hence, the reported models include only avoidant and religious coping. See Tables 3 and 4 for details of model paths and model fit indices (Schermelleh-Engel, Moosbrugger, & Müller, 2003).

3.2.1. AES (see Fig. 2)

The total effect of the AES on distress was strongly negative. The negative indirect path via avoidant coping explains most of this

Table 2
Correlation matrix.

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. AES	.91																
2. WLEIS	.57	.94															
3. TEIQue	.83	.59	.92														
4. Neuroticism	-.57	-.52	-.77	.86													
5. Extraversion	.50	.49	.61	-.53	.84												
6. Agreeableness	.65	.46	.68	-.58	.46	.82											
7. Openness	.60	.25	.50	-.22	.32	.43	.80										
8. Conscientiousness	.64	.52	.76	-.63	.52	.56	.46	.85									
9. Reappraisal	.41	.65	.40	-.36	.30	.35	.29	.29	.85								
10. Suppression	-.39	.14	-.26	.12	-.09	-.23	-.16	-.12	.22	.79							
11. Avoid coping	-.59	.12	-.57	.41	-.16	-.42	-.42	-.55	.01	.38	.85						
12. Positive coping	.40	.62	.41	-.29	.35	.29	.29	.34	.59	.11	.20	.79					
13. Support coping	.11	.27	.03	-.02	.25	.12	-.06	-.07	.26	-.11	.39	.40	.77				
14. Humour coping	-.20	.05	-.17	-.05	-.02	-.18	-.20	-.25	.14	.10	.49	.22	.35	.90			
15. Religion coping	-.01	.27	.01	.03	.25	.07	-.12	.06	.17	.19	.25	.250	.26	.01	.74		
16. Stress	-.60	-.21	-.64	.53	-.26	-.54	-.42	-.56	-.13	.30	.75	-.03	.28	.34	.21	.95	
17. Anxiety	-.60	-.14	-.62	.48	-.18	-.52	-.45	-.53	-.09	.37	.78	.00	.27	.34	.28	.94	.96

Note: $N = 423$. Reliabilities (Cronbach's alphas) are on the diagonal with correlations on the lower triangle. $rs > |.100|$ are statistically significant, $p < .05$.

Table 3
Direct and indirect effects of TEI on psychological distress.

Effect	AES	WLEIS	TEIQue
Total effect	-.604***	[-.665, -.552]	-.158**
Direct effect	-.202***	[-.323, -.082]	-.039
Indirect effect	-.402***	[-.503, -.300]	-.119*
Total	-.367***	[-.435, -.309]	-.082*
Via avoidant coping	-.001	[-.014, .012]	.028*
Via religious coping	-.020	[-.058, .018]	-.082*
Via reappraisal	-.014	[-.048, .015]	.015
Via suppression			

Note: Numbers in cells are standardised path coefficients [95% confidence intervals].

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Table 4
Model fit indices.

Scale	$\chi^2(38)$	RMSEA	95% CI		CFI	SRMR
			LB	UB		
AES	369.429	.144	.130	.157	.871	.084
TEIQue	345.257	.140	.127	.154	.884	.080
WLEIS	569.853	.182	.169	.195	.778	.180

Note: χ^2 = chi square statistic, RMSEA = root mean square error of approximation, CI = confidence interval, LB = lower bound, UB = upper bound, CFI = comparative fit index, SRMR = standardised root mean square residual.

effect, although a small negative direct effect was also significant: Higher AES individuals experienced less distress, primarily due to using less avoidant coping. Indirect effects via reappraisal, suppression and religious coping were not significant. Model fit indices were lower than ideal. All FFM traits were statistically significant in the expected direction except for extraversion. This model explained 67% of the variance in distress.

3.2.2. TEIQue (see Fig. 3)

The total, negative effect of the TEIQue on distress was slightly stronger than the AES, and was partitioned between the direct and indirect (via avoidant coping) effects. As with the AES, this shows that high TEIQue individuals experience less distress, partially due to less use of avoidant coping. Again, reappraisal, suppression and religious coping were not significant. Model fit indices were similar to the AES model. All personality paths were significant and in the expected direction. This model explained 69% of the variance in distress.

3.2.3. WLEIS (see Fig. 4)

The results for the WLEIS model differed in a number of respects from the previous two. The total effect on distress was substantially smaller, and the direct effect was not statistically significant. Indirect effects via reappraisal, avoidant and religious coping were statistically significant (although weak), and the effect via

suppression was almost significant (though very weak). Surprisingly, the WLEIS had a positive indirect effect on distress via suppression and religious coping: Higher WLEIS individuals used more suppression and religious coping, and experienced greater psychological distress. However, the reappraisal path was negative: Higher WLEIS individuals used more reappraisal, which is associated with lower distress. The direction of these effects could explain the small size of the overall WLEIS–distress effect, as the positive and negative effects cancelled each other out. All personality paths were in the expected direction and all were significant except openness. Model fit indices were less than satisfactory. This model explained 63% of the variance in distress.

3.2.4. Language differences

We assessed potential differences in model fit due to participants' native language (English or non-English) using Chi-square difference tests between the model where parameters were constrained between groups, and the model where parameters were free to vary (Milfont & Fischer, 2010). The tests for the AES and TEIQue were not statistically significant: AES $\chi^2(16) = 25.322$, $p = .064$; TEIQue $\chi^2(16) = 23.328$, $p = .105$, both against a critical $\chi^2(16)$ of 26.30 (Howell, 2009). The same test applied to the WLEIS test was statistically significant ($\chi^2(16) = 40.303$, $p < .001$). Given this, more specific tests for invariance of parameters across groups were performed using Stata v.13 (StataCorp, 2013), which reported if structural coefficients or measurement coefficients were significantly different across groups. Results demonstrated that the structural coefficients varied (Wald $\chi^2(14) = 26.208$, $p = .024$). Finally, an investigation of which individual paths differed across groups (Sörbom, 1989) showed only two significant results: openness (Wald $\chi^2(1) = 9.108$, $p = .003$) and conscientiousness (Wald $\chi^2(1) = 7.571$, $p = .006$), which were significantly stronger in the non-English-speaking than the English-speaking group. Importantly, the lack of other significant results indicates that the TEI–distress relationships do not vary across different language groups.

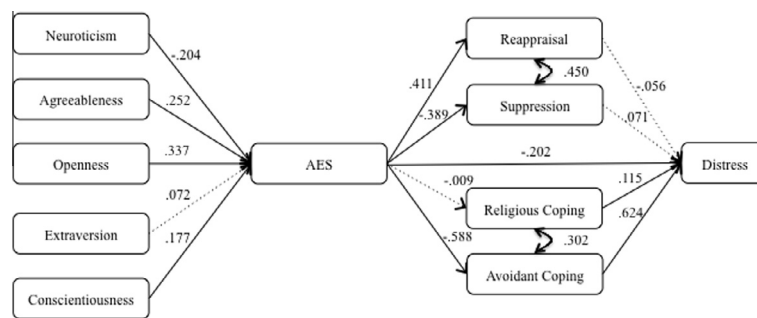


Fig. 2. AES model including standardised coefficients. Dotted lines represent non significant paths.

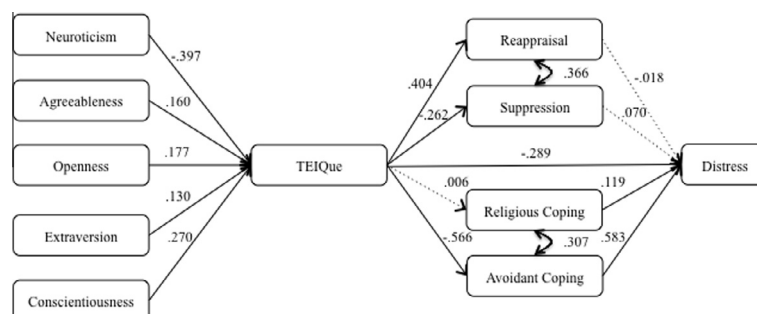


Fig. 3. TEIQue model including standardised coefficients. Dotted lines represent non significant paths.

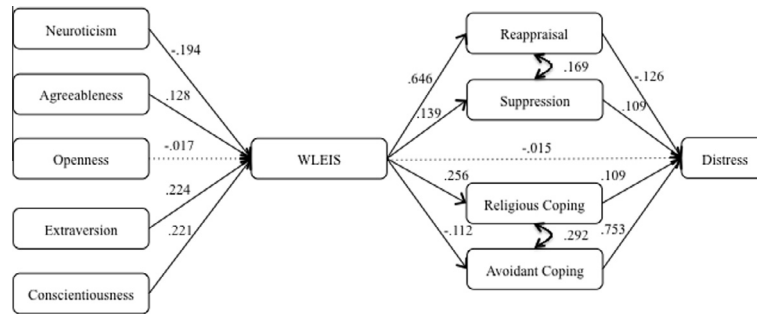


Fig. 4. WLEIS model including standardised coefficients. Dotted lines represent non significant paths.

4. Discussion

This study extended previous research by examining the extent to which coping and ER explain the TEI–distress association, across three different scales: the AES, WLEIS and TEIQue. The AES–distress association was mostly explained via reduced use of avoidant coping: Higher AES individuals used less avoidant coping, and experienced lower psychological distress. A small direct path from the AES to distress indicated that some of the AES effect was unaccounted for by coping. In contrast, the TEIQue demonstrated approximately equal indirect (via avoidant coping) and direct effects on distress, resulting in a slightly larger total effect. This direct TEIQue path is consistent with findings that under stress, high TEIQue individuals have lower cortisol response (Mikolajczak, Roy, Luminet, Fillee, & de Timary, 2007) and heart rate (Laborde, Brüll, Weber, & Anders, 2011). This suggests physiological stress-response differences between high and low TEIQue individuals that protect against stress and anxiety, regardless of coping styles and ER strategies. Perhaps this physiological mechanism is also captured by the AES, given that a significant (albeit smaller) direct effect was found. In fact, it is interesting that the TEIQue and AES results were so similar, given that Petrides and colleagues do not consider the AES to assess the complete TEI sampling domain that is measured by the TEIQue (Pérez, Petrides, & Furnham, 2005). Future research should investigate whether this finding was the result of using the modified AES (Austin et al., 2004).

4.1. WLEIS

Most research using the WLEIS has been in organisational settings (see Jordan, Murray, & Lawrence, 2009), which makes the present results particularly novel. WLEIS scores predicted the greatest number of mechanisms: Higher WLEIS individuals experienced lower distress via less use of avoidant coping and greater use of reappraisal, though with weak effects. Unexpectedly, the WLEIS also positively predicted distress through greater use of suppression and religious coping. While suppression tends to increase negative affect in the context of a stressor (Gross & John, 2003), the broader benefit or cost of emotion regulation (Aldao, 2013) and religious coping (Ano & Vasconcelles, 2005) has been shown to be context-dependent, depending on how each is utilised in any particular context. Perhaps high WLEIS individuals are more likely to use suppression and religious coping in some work-related situations with the aim of improving performance, even if the cost is greater stress and anxiety.

4.2. Strengths and limitations

This study is novel in its comparison of effects among three different TEI scales, and its use of a demographically broader sample,

giving greater external validity to the results compared to those typically obtained from more homogenous samples. While analyses of group differences showed that key associations did not differ between the native English speaking and non-English speaking participants, and research has shown that the prevalence of depression and general anxiety is similar in an Mturk sample compared to general population (Shapiro, Chandler, & Mueller, 2013), the results do need replication to see if they equally apply in other samples.

One limitation to this study, however, is its cross-sectional methodology. While the analyses and results suggest that coping and ER may have indirect effects on distress, a longitudinal study is needed to evaluate whether they mediate the relationship. Additionally, the use of brief measures (TEIQue-SF and Brief COPE) was not ideal, as they provide less comprehensive measures of the constructs than the full versions. The choice of the brief versions was based on practicality, given the number of survey measures included and the large sample size needed. Future research should attempt to replicate the effects found here using full measures.

4.3. Implications and conclusions

This study is the first of its kind to compare different measures of TEI and their relationships with psychological distress, and the results are enlightening. The AES results show that its association with psychological distress may primarily be a function of less avoidant coping. The TEIQue, too, was associated with avoidant coping, but in addition, was directly and negatively associated with psychological distress. This could reflect the assessment of a unique, physiological stress response. Finally, the WLEIS predicts the greatest number of mechanisms, both adaptive (reappraisal and less avoidant coping) and maladaptive (suppression and religious coping). While it has been argued that the TEIQue is unique in its comprehensive assessment of the TEI domain compared to the AES and WLEIS (Pérez et al., 2005), we have shown that the TEIQue and AES are actually quite similar, and that the WLEIS is divergent in its associations with a greater number of mechanisms. These results show that coping, and to a lesser extent reappraisal and suppression, are important factors in explaining how TEI predicts less psychological distress, but the extent of that importance differs by TEI scale. Researchers should use the results of this study to guide selection of TEI scales in future research on the heterogeneity of TEI.

Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at <http://dx.doi.org/10.1016/j.paid.2014.12.015>.

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Appendix D: Supplementary Material for Chapter 4.

Factor Analyses

An exploratory factor analysis (EFA) was conducted using SPSS (v.20) to establish the initial coping factor structure, using principal axis factor extraction with varimax rotation. This indicated which items grouped clearly in the current context. A five-factor solution for the coping scale was produced by the EFA (see Tables 1 and 2 below). Two items had similar loadings across two factors (items asking about expressing feelings loaded onto the avoidant and social factors similarly), so it was decided to allocate them to the avoidant factor due to their greater conceptual similarity with other avoidant, rather than social, items.

Since exploratory models may yield some factors which are sample noise, the structure was verified with a confirmatory factor analysis (CFA) on the same sample using Stata (v.13; StataCorp, 2013), which produced goodness of fit statistics and individual item weights. The CFA model was constructed to reflect the EFA results as presented in Supplementary Material Table 2. The CFA model was not intended to validate the factor structure but to assess whether it adequately described the correlations among the Brief COPE items. The CFA confirmed the five-factor structure, with all item loadings statistically significant. Using recommended guidelines (Schermelleh-Engel, Moosbrugger, & Müller, 2003), model fit indices met or were close to target values, $\chi^2(284) = 561.991$, $p < .001$; χ^2/df ratio = 1.98; RMSEA = .048, $p_{\text{close}} = .697$; CFI = .928, SRMR = .075, and were deemed satisfactory. The small goodness-of-fit p -value is likely to be due to high power for this test. Individual items were summed to create the five coping factor scores. Nine items each assessed avoidant coping, describing passive or avoidant behaviours, and positive coping, describing practical or instrumental behaviours. Five items assessed social coping, describing support-seeking behaviours. Two items each assessed religious coping and humour coping.

Table 1

Exploratory Factor Analysis information

Factor	Initial eigenvalue	Initial per cent of variance
Avoidant	6.190	23.808
Active	3.658	14.068
Social	1.877	7.134
Religious	1.626	6.254
Humour	1.031	3.967

Table 2

EFA Item Loadings. "I've been..."

Item	Factor	Loading
Avoidant Coping		
Refusing to believe that it has happened		.709
Giving up trying to deal with it		.699
Giving up the attempt to cope		.696
Using alcohol or other drugs to make myself feel better		.687
Using alcohol or other drugs to help me get through it		.667
Saying to myself "this isn't real"		.665
I've been doing something to think about it less, such as daydream		.533
Saying things to let my unpleasant feelings escape		.497
Accepting the reality of the fact that it has happened		.274
Expressing my feelings		.422
Active Coping		
Trying to come up with a strategy about what to do		.698
Thinking hard about what steps to take		.677
Looking for something good in what's happening		.626
Concentrating my efforts to do something about the situation I'm in		.611
Trying to see it in a different light, to make it seem more positive		.577
Taking action to try and make the situation better		.567
Learning to live with it		.381
Turning to work or other activities to take my mind off things		.310
Saying things to let my unpleasant feelings escape		.346
Accepting the reality of the fact that it has happened		.237
Social Coping		
Getting emotional support from others		.648
Getting help and advice from other people		.613
Trying to get advice or help from other people about what to do		.599
Getting comfort and understanding from someone		.579
Expressing my feelings		.467
Religious Coping		
Praying or meditating		.864
Trying to find comfort in my religion or spiritual beliefs		.853
Humour Coping		
Making jokes about it		.643
Making fun of the situation		.592

Note. Bold font indicates factor loading.

Appendix E: Supplementary Material for Chapter 5.

Vignettes used in Studies 1 and 2

(a) University scenario

Alex has a major assessment due soon for a university subject, which is worth 70% of his final grade for the unit, and Alex is very anxious about it. Generally an ok student, Alex has passed all of his units, though for a few he has just scraped through. He is worried about not doing well enough in this assessment to pass the course, as he has barely passed her previous assessments in this course. Success at university is very important to Alex, who is working towards a Business degree, ultimately to end up working in a family business.

(b) Relationship scenario

Alex just had a big fight with his girlfriend, and thinks that the relationship is over, which makes Alex very upset. Alex believes he was very much in love, had been with his girlfriend for almost a year and, although they did fight occasionally, Alex didn't think this particular fight was bad enough to warrant the end of the relationship. However, Alex's girlfriend says it's definitely over.

(c) Work scenario

Alex is having some issues at work that are making him feel very frustrated. Alex's work supervisor keeps changing Alex's shifts around, often at the last minute, often resulting in Alex not being able to work, as he is studying full-time as well as working part-time. This job took Alex a while to find initially, as it's particularly relevant to his degree. The longer he keeps working there, the higher the chance of a promotion, and the more likely the company is to employ him full-time when he finishes his degree. Additionally, finding another job in the same industry would be difficult, and if he were to change jobs, he'd have to essentially start from the bottom again, which he does not want to do, having worked hard to get to the position he is currently in. Alex works hard at his job, but is getting increasingly frustrated with his manager, and feels he is in a precarious position.

Instructions to participants in Study 2

This exercise involves imagining yourself as a therapist-in-training, seeing and advising a client. You are going to read about a client's problem, and we want you to write out advice to the client. Specifically, we want you to restrict your advice to cognitive reappraisal – that is, trying to get your client to think differently about the situation, in order to make them feel better. This is the kind of strategy often used in cognitive behavioural therapy (CBT) – changing the way people appraise, or think about, situations that cause them to experience negative emotions. When you're advising your client, please restrict your advice to the strategy of cognitive reappraisal only.

While you are playing therapist, it might help you to put yourself in the client's shoes and think about how you would feel if you were in their situation. What do you think would be most effective in changing the way they think about the situation? Try to make your advice as realistic as possible, while also trying to be as helpful to your client as possible. Your client, Alex, is someone who has fairly good self-reflective abilities and is quite self-aware. Alex is 20 a year-old, a full-time student, who you have been seeing for several sessions, and has come to you with a new problem.

[Vignette here]

You want to try to help Alex to stop feeling so [anxious/upset/frustrated]. This is your chance to 'play therapist'! What would you say to reassure him? Please try to restrict your advice to using *only* the strategy of cognitive reappraisal – that is, trying to get Alex to think differently about the situation [the upcoming assessment / the fight and potential break-up / the problems with his manager], in order to feel less [anxious/upset/frustrated]. Try to think of what you could say that would be the most helpful, using this strategy. Try to write as much as you can, in as much detail as you can, in the time provided.

Table 1.

Non-significant effects of gender of protagonist on participants' ratings in Study 2.

Factor	Effect					
	Gender			Gender x condition		
	<i>df</i>	<i>F</i>	<i>p</i>	<i>df</i>	<i>F</i>	<i>p</i>
Control	1, 52	0.097	.757	2, 140	1.321	.271
Likely	1, 52	0.825	.368	2, 140	0.987	.376
Fear	1, 52	0.375	.543	2, 98	0.030	.970
Hostile	1, 52	0.337	.564	2, 98	0.240	.787
Guilt	1, 52	2.428	.125	2, 140	0.000	.996
Sad	1, 52	0.002	.962	2, 140	0.041	.959
Serene	1, 52	0.587	.447	2, 140	0.628	.536

Appendix F: Supplementary Material for Chapter 6.

Reappraisal instructions for Study 1.

Situation-focused reappraisal:

You might find it helpful to focus on what you'll learn from the feedback. Think about how you can improve your speech after receiving the feedback, so you can make it better and have a better chance of doing the best, and thus winning the prize. Take any feedback as an opportunity to improve, so you'll have a better chance of doing the best in the task, and therefore winning the prize.

Goal-focused reappraisal:

You might find it helpful to focus on what you'll learn from the feedback. Even if you don't win the prize, that's ok, because it's not a big deal anyway. Try to think about what you'll learn from the experience anyway, and how it might help your studies, like when you have to construct an argument and make a speech in class. Take any feedback as an opportunity in the broader sense, and don't worry about winning the prize.

Table 1.

Personality effects from the personality x time repeated measures GLM models.

Personality factor	<i>F</i>	<i>p</i>	η_p^2
Neuroticism	1.610	.213	.074
Extraversion	2.930	.065	.128
Openness	0.868	.427	.042
Agreeableness	0.257	.774	.013
Conscientiousness	0.873	.425	.042

Note. *F* with 2 and 40 degrees of freedom.

Appendix G: Letter of Approval from Macquarie University Human
Research Ethics Committee for Chapter 3.

Office of the Deputy Vice-Chancellor
(Research)

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Research Hub, Building C5C East
Macquarie University
NSW 2109 Australia
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<http://www.research.mq.edu.au/>
ABN 90 952 801 237



MACQUARIE
University
SYDNEY · AUSTRALIA

10 March 2015

Ms Alissa Beath
Department of Psychology
Faculty of Human Sciences
Macquarie University
NSW 2109

Dear Ms Beath

Reference No: HE27NOV2009-D00202

Title: *The role of Emotional Intelligence in protection against stress*

This letter is to confirm that the above application received final approval from the Macquarie University Human Research Ethics Committee on 17 February 2010.

The HREC (Human Sciences and Humanities) wishes you every success in your research.

Yours sincerely

Dr Karolyn White

Director, Research Ethics & Integrity,
Chair, Human Research Ethics Committee (Human Sciences and Humanities)

This HREC is constituted and operates in accordance with the National Health and Medical Research Council's (NHMRC) *National Statement on Ethical Conduct in Human Research* (2007) and the *CPMP/ICH Note for Guidance on Good Clinical Practice*.

Appendix G: Letters of Approval from the Macquarie University

Human Research Ethics Committee for Chapter 4.



Approved- Ethics application - Crane (Ref No: 5201300159)

1 message

Ethics Secretariat <ethics.secretariat@mq.edu.au>

18 April 2013 at 12:27

To: Professor Mike Jones <mike.jones@mq.edu.au>

Cc: Miss Alissa Pauline Beath <alissa.beath@students.mq.edu.au>

Dear A/Prof Jones

Re: "Modelling coping with stress" (Ethics Ref: 5201300159)

Thank you for your recent correspondence. Your response has addressed the issues raised by the Human Research Ethics Committee and you may now commence your research.

This research meets the requirements of the National Statement on Ethical Conduct in Human Research (2007). The National Statement is available at the following web site:

http://www.nhmrc.gov.au/_files_nhmrc/publications/attachments/e72.pdf.

The following personnel are authorised to conduct this research:

A/Prof Mike Jones

Miss Alissa Pauline Beath

NB. STUDENTS: IT IS YOUR RESPONSIBILITY TO KEEP A COPY OF THIS APPROVAL EMAIL TO SUBMIT WITH YOUR THESIS.

Please note the following standard requirements of approval:

1. The approval of this project is conditional upon your continuing compliance with the National Statement on Ethical Conduct in Human Research (2007).
2. Approval will be for a period of five (5) years subject to the provision of annual reports.

Progress Report 1 Due: 18 April 2014

Progress Report 2 Due: 18 April 2015

Progress Report 3 Due: 18 April 2016

Progress Report 4 Due: 18 April 2017

Final Report Due: 18 April 2018

NB. If you complete the work earlier than you had planned you must submit a Final Report as soon as the work is completed. If the project has been discontinued or not commenced for any reason, you are also required to submit a Final Report for the project.

Progress reports and Final Reports are available at the following website:

http://www.research.mq.edu.au/for/researchers/how_to_obtain_ethics_approval/human_research_ethics/forms

3. If the project has run for more than five (5) years you cannot renew approval for the project. You will need to complete and submit a Final Report and submit a new application for the project. (The five year limit on renewal of approvals allows the Committee to fully re-review research in an environment where legislation, guidelines and requirements are

continually changing, for example, new child protection and privacy laws).

4. All amendments to the project must be reviewed and approved by the Committee before implementation. Please complete and submit a Request for Amendment Form available at the following website:

http://www.research.mq.edu.au/for/researchers/how_to_obtain_ethics_approval/human_research_ethics/forms

5. Please notify the Committee immediately in the event of any adverse effects on participants or of any unforeseen events that affect the continued ethical acceptability of the project.

6. At all times you are responsible for the ethical conduct of your research in accordance with the guidelines established by the University. This information is available at the following websites:

<http://www.mq.edu.au/policy/>

http://www.research.mq.edu.au/for/researchers/how_to_obtain_ethics_approval/human_research_ethics/policy

If you will be applying for or have applied for internal or external funding for the above project it is your responsibility to provide the Macquarie University's Research Grants Management Assistant with a copy of this email as soon as possible. Internal and External funding agencies will not be informed that you have final approval for your project and funds will not be released until the Research Grants Management Assistant has received a copy of this email.

Please retain a copy of this email as this is your official notification of final ethics approval.

Yours sincerely
Dr Karolyn White
Director of Research Ethics
Chair, Human Research Ethics Committee

Appendix H: Letters of Approval from the Macquarie University

Human Research Ethics Committee for Chapter 5



Final Approval- Ethics application reference 5201100094

1 message

Ethics Secretariat <ethics.secretariat@mq.edu.au>

14 April 2011 at 09:02

To: A/Prof Mike Jones <mike.jones@mq.edu.au>

Cc: Ms Alissa Beath <alissa.beath@mq.edu.au>

Dear A/Prof Jones

Re: "Exploring cognitive reappraisal" (Ethics Ref: 5201100094)

Thank you for your recent correspondence. Your response has addressed the issues raised by the Human Research Ethics Committee and you may now commence your research.

The following personnel are authorised to conduct this research:

A/Prof Mike Jones- Chief Investigator/Supervisor

Ms Alissa Beath- Co-Investigator

NB. STUDENTS: IT IS YOUR RESPONSIBILITY TO KEEP A COPY OF THIS APPROVAL EMAIL TO SUBMIT WITH YOUR THESIS.

Please note the following standard requirements of approval:

1. The approval of this project is conditional upon your continuing compliance with the National Statement on Ethical Conduct in Human Research (2007).
2. Approval will be for a period of five (5) years subject to the provision of annual reports. Your first progress report is due on 14 April 2012.

If you complete the work earlier than you had planned you must submit a Final Report as soon as the work is completed. If the project has been discontinued or not commenced for any reason, you are also required to submit a Final Report for the project.

Progress reports and Final Reports are available at the following website:

http://www.research.mq.edu.au/for/researchers/how_to_obtain_ethics_approval/human_research_ethics/forms

3. If the project has run for more than five (5) years you cannot renew approval for the project. You will need to complete and submit a Final Report and submit a new application for the project. (The five year limit on renewal of approvals allows the Committee to fully re-review research in an environment where legislation, guidelines and requirements are continually changing, for example, new child protection and privacy laws).
4. All amendments to the project must be reviewed and approved by the Committee before implementation. Please complete and submit a Request for Amendment Form available at the following website:

http://www.research.mq.edu.au/for/researchers/how_to_obtain_ethics_approval/human_research_ethics/forms
5. Please notify the Committee immediately in the event of any adverse effects on participants or of any unforeseen events that affect the continued ethical acceptability of the project.

6. At all times you are responsible for the ethical conduct of your research in accordance with the guidelines established by the University. This information is available at the following websites:

<http://www.mq.edu.au/policy/>

http://www.research.mq.edu.au/for/researchers/how_to_obtain_ethics_approval/human_research_ethics/policy

If you will be applying for or have applied for internal or external funding for the above project it is your responsibility to provide the Macquarie University's Research Grants Management Assistant with a copy of this email as soon as possible. Internal and External funding agencies will not be informed that you have final approval for your project and funds will not be released until the Research Grants Management Assistant has received a copy of this email.

If you need to provide a hard copy letter of Final Approval to an external organisation as evidence that you have Final Approval, please do not hesitate to contact the Ethics Secretariat at the address below.

Please retain a copy of this email as this is your official notification of final ethics approval.

Yours sincerely
Dr Karolyn White
Director of Research Ethics
Chair, Human Research Ethics Committee



Final Approval - Jones (Ref: 5201100740)

1 message

Fhs Ethics <fhs.ethics@mq.edu.au>

6 October 2011 at 14:04

To: A/Prof Mike Jones <mike.jones@mq.edu.au>

Cc: Miss Alissa Pauline Beath <alissa.beath@students.mq.edu.au>

Dear A/Prof Jones,

Re: "Cognitive reappraisal advice"

The above application was reviewed by The Faculty of Human Sciences Human Research Ethics Sub-Committee. The Sub-Committee wishes to thank you for a thorough and well prepared application. Approval of the above application is granted and you may now proceed with your research.

The following personnel are authorised to conduct this research:

A/Prof Mike Jones
Miss Alissa Pauline Beath

Please note the following standard requirements of approval:

1. The approval of this project is conditional upon your continuing compliance with the National Statement on Ethical Conduct in Human Research (2007).
2. Approval will be for a period of five (5) years subject to the provision of annual reports. Your first progress report is due on 1st September 2012.

If you complete the work earlier than you had planned you must submit a Final Report as soon as the work is completed. If the project has been discontinued or not commenced for any reason, you are also required to submit a Final Report for the project.

Progress reports and Final Reports are available at the following website:

http://www.research.mq.edu.au/for/researchers/how_to_obtain_ethics_approval/human_research_ethics/forms

3. If the project has run for more than five (5) years you cannot renew approval for the project. You will need to complete and submit a Final Report and submit a new application for the project. (The five year limit on renewal of approvals allows the Sub-Committee to fully re-review research in an environment where legislation, guidelines and requirements are continually changing, for example, new child protection and privacy laws).

4. All amendments to the project must be reviewed and approved by the Sub-Committee before implementation. Please complete and submit a Request for Amendment Form available at the following website:

http://www.research.mq.edu.au/for/researchers/how_to_obtain_ethics_approval/human_research_ethics/forms

5. Please notify the Sub-Committee immediately in the event of any adverse effects on participants or of any unforeseen events that affect the continued ethical acceptability of the project.

6. At all times you are responsible for the ethical conduct of your research in accordance with the guidelines established by the University. This information is available at the following websites:

<http://www.mq.edu.au/policy>

http://www.research.mq.edu.au/for/researchers/how_to_obtain_ethics_approval/human_research_ethics/policy

If you will be applying for or have applied for internal or external funding for the above project it is your responsibility to provide the Macquarie University's Research Grants Management Assistant with a copy of this email as soon as possible. Internal and External funding agencies will not be informed that you have final approval for your project and funds will not be released until the Research Grants Management Assistant has received a copy of this email.

If you need to provide a hard copy letter of Final Approval to an external organisation as evidence that you have Final Approval, please do not hesitate to contact the Ethics Secretariat at the address below.

Please retain a copy of this email as this is your official notification of final ethics approval.

Yours sincerely,

Dr Peter Roger

Chair
Faculty of Human Sciences
Human Research Ethics Sub-Committee

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Appendix I: Letters of Approval from the Macquarie University

Human Research Ethics Committee for Chapter 6



10 December 2013

Professor Michael Jones
Department of Psychology
Faculty of Human Sciences
Macquarie University

Dear Professor Jones

Re: *Types of Cognitive Reappraisal*

Thank you for the email dated 10 December 2013 responding to the issues raised by the Macquarie University Human Research Ethics Committee (HREC) (Human Sciences and Humanities).

The HREC (Human Sciences and Humanities) delegated review of your response to the Ethics Secretariat. This research meets the requirements set out in the *National Statement on Ethical Conduct in Human Research* (2007) (the *National Statement*) and approval is granted.

Details of this approval are as follows:

Reference No: 5201300810

Approval Date: 10 December 2013

This letter constitutes ethical approval only.

The following documentation has been reviewed and approved by the HREC (Human Sciences and Humanities):

Documents reviewed	Version no.	Date
Macquarie University HREC Application Form	2.3	Received 12 Nov 2013
Correspondence from Professor Jones addressing the HREC's feedback		Received 10 Dec 2013
MQ Participant Information and Consent Form (PICF)		Received 12 Nov 2013
MQ Debrief information and Consent Form		Received 10 Dec 2013
SONA Advertisement		Received 10 Dec 2013
Demographic questionnaire		Received 10 Dec 2013

Questionnaires: Brief Fear of Negative Evaluation Scale and Positive and Negative Affect Scale (PANAS),	Received 12 Nov 2013
Task instructions, cognitive reappraisal instructions and negative task feedback	Received 12 Nov 2013

Standard Conditions of Approval:

1. Continuing compliance with the requirements of the *National Statement*, which is available at the following website:

<http://www.nhmrc.gov.au/book/national-statement-ethical-conduct-human-research>

2. Approval is for five (5) years, subject to the submission of annual reports.

First Annual Report Due: 1 December 2014

3. All adverse events must be reported to the HREC within 72 hours.

4. Proposed changes to the protocol must be submitted to the Committee for approval before implementation.

It is the responsibility of the Chief investigator to retain a copy of all documentation related to this project and to forward a copy of this approval letter to all personnel listed on the project.

Please do not hesitate to contact the Ethics Secretariat should you have any questions regarding your ethics application.

The HREC (Human Sciences and Humanities) wishes you every success in your research.

Yours sincerely



Dr Karolyn White

Director, Research Ethics

Chair, Human Research Ethics Committee (Human Sciences and Humanities)

This HREC is constituted and operates in accordance with the National Health and Medical Research Council's (NHMRC) National Statement on Ethical Conduct in Human Research (2007) (the National Statement) and the CPMP/ICH Note for Guidance on Good Clinical Practice.



29 May 2014

Professor Mike Jones
Department of Psychology
Faculty of Human Sciences
Macquarie University NSW 2109

Dear Professor Jones

RE: Emotional intelligence and cognitive reappraisal under stress

Thank you for submitting the above application for ethical and scientific review. Your application was first considered by the Macquarie University Human Research Ethics Committee (HREC (Medical Sciences)) at its meeting on 27th March 2014 at which further information was requested to be reviewed by the HREC (Medical Sciences) Executive out of session.

The requested information was received with correspondence on 23rd April 2014 and an amendment request was received on 13th May 2014.

I am pleased to advise that ethical and scientific approval has been granted for this project.

This research meets the requirements set out in the *National Statement on Ethical Conduct in Human Research* (2007- Updated March 2014) (the *National Statement*).

Details of this approval are as follows:

Reference No: 5201400340

Approval Date: 29 May 2014

The following documentation has been reviewed and approved by the HREC (Medical Sciences):

Documents reviewed	Version no.	Date
Macquarie University Human Research Ethics Committee (HREC) Application Form	2.3	Jul 2013
Macquarie University Amendment Request Form	2.0	Jan 2014
Participant information and consent form: (Researcher and Participant copies)	2	15 Apr 2014
Participant Questionnaire	5	15 Apr 2014
Debrief and re-consent form	2	15 Apr 2014
Survey Measures	1	15 Apr 2014
Cognitive task: Raven's Advanced Progressive Matrices		
Questions relating to students' future career	1	13 May 2014

This letter constitutes ethical and scientific approval only.

Standard Conditions of Approval:

1. Continuing compliance with the requirements of the *National Statement*, which is available at the following website:

<http://www.nhmrc.gov.au/book/national-statement-ethical-conduct-human-research>

2. This approval is valid for five (5) years, subject to the submission of annual reports. Please submit your reports on the anniversary of the approval for this protocol.

3. All adverse events, including events which might affect the continued ethical and scientific acceptability of the project, must be reported to the HREC within 72 hours.

4. Proposed changes to the protocol must be submitted to the Committee for approval before implementation.

It is the responsibility of the Chief investigator to retain a copy of all documentation related to this project and to forward a copy of this approval letter to all personnel listed on the project.

Should you have any queries regarding your project, please contact the Ethics Secretariat on 9850 4194 or by email ethics.secretariat@mq.edu.au

The HREC (Medical Sciences) Terms of Reference and Standard Operating Procedures are available from the Research Office website at:

http://www.research.mq.edu.au/for/researchers/how_to_obtain_ethics_approval/human_research_ethics

The HREC (Medical Sciences) wishes you every success in your research.

Yours sincerely



Professor Tony Eyers

Chair, Macquarie University Human Research Ethics Committee (Medical Sciences)

This HREC is constituted and operates in accordance with the National Health and Medical Research Council's (NHMRC) *National Statement on Ethical Conduct in Human Research* (2007) and the *CPMP/ICH Note for Guidance on Good Clinical Practice*.