Effectively coping with task stress: a study of the validity of the Trait Emotional Intelligence Questionnaire-Short Form (TEIQue-SF)

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Effectively Coping with Task-Stress: A Study of the Validity of the Trait Emotional Intelligence Questionnaire-Short Form (TEIQue-SF).

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Abstract. In this study, we investigated the validity of the Trait Emotional Intelligence Questionnaire-Short Form (TEIQue-SF; Petrides, 2009) in the context of task-induced stress. We used a total sample of 225 volunteers to investigate (1) the incremental validity of the TEIQue-SF over other predictors of coping with task-induced stress, and (2) the construct validity of the TEIQue-SF by examining the mechanism/s via which scores from the TEIQue-SF predict coping outcomes. Results demonstrated that the TEIQue-SF possessed incremental validity over the Big Five personality traits in the prediction of emotion-focused coping. Results also provided support for the construct validity of the TEIQue-SF by demonstrating that this measure predicted adaptive coping via emotion-focused channels. Specifically, results showed that, following a task stressor, the TEIQue-SF predicted low negative affect and high task performance via high levels of emotion-focused coping. Consistent with the purported theoretical nature of the trait EI construct, trait EI as assessed by the TEIQue-SF primarily enhances affect and performance in stressful situations by regulating negative emotions.
**Keywords.** task-induced stress, problem-focused coping, emotion-focused coping, trait emotional intelligence, negative affect

Trait Emotional Intelligence (trait EI) can be defined as a distinct, stable set of emotion-related self-perceptions and adaptive emotional dispositions (Petrides, Pita, & Kokkinaki, 2007). Individuals high in trait EI can be described as optimistic and adaptable, and perceive themselves to have high levels of intrapersonal and interpersonal emotional competencies, such as emotional self-awareness and empathy (Bar-On, 2006; Petrides & Furnham, 2001). Trait EI is distinct from ability EI, which refers to a set of emotion-related cognitive abilities regarding the nature, causes and outcomes of emotions, such as knowing the most appropriate emotion for a particular situation. Additionally, trait EI is most commonly operationalized using self-report personality-style questionnaires, whereas ability EI is most commonly operationalized using tests of maximal performance akin to cognitive ability tests (see Austin, 2004; Petrides, Pita, & Kokkinaki, 2007). A substantial literature has demonstrated that trait EI is also distinct from the Big 5 personality traits (e.g., Petrides & Furnham, 2001) and that measures of trait EI can predict a range of criteria when controlling for the Big 5, such as life satisfaction (Andrei, Siegling, Aloe, Baldaro, & Petrides, 2015; Petrides, Pita, & Kokkinaki, 2007; Siegling, Vesely, Petrides, & Saklofske, 2015), depression, and a range of personality disorders (Petrides, Perez-Gonzalez, & Furnham, 2007).

A popular and well-supported measure of trait EI is the TEIQue-SF. This measure, along with its corresponding full version (TEIQue), has been shown to possess good psychometric properties in terms of item characteristics (Cooper & Petrides, 2010), factor structure (Perera, 2015), concurrent and construct validity (Laborde, Allen, & Gullien, 2016). Additionally, the TEIQue-SF is particularly appealing because it has a strong conceptual basis. The TEIQue-SF was developed after the fundamental distinction in the literature between trait and ability forms of EI (Petrides & Furnham, 2000; 2001), and was specifically designed to measure a personality trait. The TEIQue-SF therefore differs from earlier self-report measures (e.g. Schutte et al., 1998) which tended to confuse ability and trait forms of EI (see Petrides & Furnham, 2000).

One of the strongest sources of evidence for the validity of the short and long forms of the TEIQue come from studies using these instruments to investigate the role of trait EI in coping with stress. This research has demonstrated that high levels of trait EI, assessed with the TEIQue or TEIQue-SF, are associated with adaptive coping styles and coping outcomes in the context of competitive stressors, life-stressors, work difficulties, relationship problems, and personal troubles (e.g., Laborde, Dosseveille, Gullen, & Chavez, 2012; Petrides, Pita, & Kokkinaki, 2007; Saklofske, Austin, Galloway, & Davidson, 2007; Siegling et al., 2015). Such research indicates that the TEIQue and TEIQue-SF can predict adaptive coping styles and adaptive outcomes, even when controlling for known predictors of these outcomes, such as the Big Five personality traits (Mikolajczak, Petrides, Coumans, & Luminet, 2009; Petrides, Pita, & Kokkinaki, 2007; Siegling et al., 2015). Overall, therefore, research on the TEIQue and TEIQue-SF in the context of stress provides support for the construct validity of these measures.
A major limitation of these studies, however, is their substantial reliance on self-report questionnaires that assess how individuals generally respond to stressful events and situations. This is a problem, because it assumes that self-report, general, trait-oriented measures of coping styles accurately capture the cognitive and emotional processes that occur at the time of stress-exposure (see Folkman, Lazarus, Dunker-Schetter, DeLongis, & Gruen, 1986 for a similar criticism of trait-oriented coping research). Furthermore, trait-oriented coping measures tend to rely on participants’ subjective assessments of general stress. For example, one popular coping measure used in research utilizing the TEIQue, the Coping Styles Questionnaire (Roger, Jarvis, & Najarian, 1993), requests that participants respond to the question “how would you describe the way you typically react to stress.” Subjective assessments of general stress are of limited value, because in reality, different types of stress/stressors have been identified, and the efficacy of coping strategies have been shown to depend on the type of stress/stressor experienced (Folkman & Lazarus, 1985).

In the current study, we seek to overcome these limitations and provide a further examination of the validity of the TEIQue-SF in the context of stress. First, in order to measure coping processes and outcomes at the time of stress exposure, we induce a mild state of stress in our participants using a behavioral task. Second, we focus on a type of stress largely neglected in trait EI research, task-induced stress: a common, temporary state of stress, evoked by a generally short-term, challenging task (Matthews, Davies, Westerman, & Stammers, 2000). Using this methodology, we seek to 1) determine whether the TEIQue-SF has incremental validity over known predictors of coping with task-based stressors, and 2) further assess the construct validity of the TEIQue-SF, by examining whether scores on this measure predict adaptive coping outcomes via adaptive coping styles in the context of task-induced stress.

1.1. Task-induced Stress

Task-induced stress is defined in this paper as a temporary state of negative affect or distress, evoked by a generally short-term, challenging task whereby task requirements are perceived as potentially exceeding ones resources. Task-stressors are common in various applied domains including education, organizational psychology, and human factors (see Matthews et al., 2000; Matthews et al., 2006) and include such diverse activities as taking university exams, completing work assignments under time pressure, and even navigating through difficult traffic (Matthews et al., 2006; Matthews & Desmond, 2002). Short-term task-stressors are different from other types of stressors such as longer-term life-stressors, in that they 1) tend to be of high intensity and short duration (e.g., preparing a presentation), 2) are cognitively demanding (e.g., negotiating a contract), and 3) are often unavoidable or even sought after (e.g., volunteering for a challenging work assignment). Ongoing life-stressors, on the other hand, are more likely to be chronic, are not necessarily cognitively demanding, and are not generally sought out (e.g., workplace bullying, illness). Importantly, effectively dealing with a short-term task-stressor often involves performing a task well (e.g., driving performance, Matthews & Desmond, 2002), whereas effectively dealing with a long-term life-stressor often involves accepting and adapting to the stressor (e.g., chronic disease: Clark, Gong, & Kaciroti, 2014).
Since short-term task-induced stress is quite different from longer term life-stress, it is possible that predictors of coping with such stressors will also be different (see also Folkman & Lazarus, 1985). Our focus on coping with task-induced stress, therefore, not only allows us to overcome limitations of previous research on the validity of the TEIQue-SF (which has tended to focus on trait-like measures of coping styles and subjective assessments of general stress), but allows us to potentially broaden the utility of the TEIQue-SF, by demonstrating an association between this measure and coping with a common, though understudied form of stress.

1.2. Coping Strategies

Current systems within psychological literature describe over 400 strategies of coping (Skinner, Edge, Altman, & Sherwood, 2003), and these responses have been classified on a range of dimensions; mainly, approach/avoidance (Finset, Steine, Haugli, Steen, & Laerum, 2002; Roth & Cohen, 1986) and emotion/problem focused coping (Lazarus & Folkman, 1984). The latter distinction will be utilized in the present investigation as it is, by far, the most commonly accepted and used higher order category of coping (Baker & Berenbaum, 2011; Skinner et al., 2003).

Problem-focused coping is most commonly defined as the process of employing problem-solving strategies to address a stressor (Carver & Connor-Smith, 2010; Lazarus & Folkman, 1984); it is utilized when individuals feel that something constructive can be directly done to alter the source of their stress (Folkman & Lazarus, 1980). This often involves task-oriented actions, such as planning or seeking instrumental support (Nes & Segerstrom, 2006). Research tends to show that problem-focused coping is associated with adaptive outcomes such as academic performance (MacCann, Fogarty, Zeidner, & Roberts, 2011) and marital satisfaction (Stoneman, Gavidia-Payne, & Floyd, 2006).

Emotion-focused coping can be defined as the process of employing emotion-based strategies in an attempt to reduce or manage the emotional distress evoked by a situation or threat (Carver & Connor-Smith, 2010; Lazarus & Folkman, 1984). This can involve functional strategies such as by reappraising or reinterpreting a stressor as being non-threatening (Lazarus, 1993) or attempting to relax using breathing techniques (Nes & Segerstrom, 2006). Emotion-focused coping can also involve dysfunctional strategies such as yelling, crying, rumination or wishful thinking (Carver & Connor-Smith, 2010). Research tends to show that functional forms of emotion-focused coping are associated with positive outcomes (Austenfeld & Stanton, 2004), whereas dysfunctional forms of emotion-focused coping are associated with a range of negative emotions and cognitions including denial, avoidance, self-blame, and interpersonal withdrawal (Carver, Scheier, & Weintraub, 1989; Compas, Connor-Smith, Saltzman, Thomsen, & Wadsworth, 2001; O'Brien & DeLongis, 1996). In the current study, we are interested in predicting and understanding effective emotional regulation in the context of stress, and therefore we define adaptive emotion-focused coping as high levels of functional and/or low levels of dysfunctional emotion-focused coping.

1.3. Emotional Intelligence and Coping

Most research on the relationship between EI and coping with task-stressors has not used trait EI, but has instead used the conceptually distinct ability EI construct (e.g., Matthews et al., 2006). Ability EI is generally defined as a set of
emotion-related cognitive abilities (Petrides & Furnham, 2000; 2001) operationalized using objective, maximum performance tests. Surprisingly, Matthews et al. found only modest effects of ability EI in the prediction of coping with task-induced stress. Specifically, ability EI as measured using the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT; Mayer, Salovey, Caruso, & Sitarenios, 2003), was found to have incremental validity over the Big Five in the prediction of task-induced avoidance coping, but not task-induced problem- or emotion-focused coping. Additionally, ability EI did not affect participants’ task-induced stress state (i.e., high ability EI individuals did not feel less stressed following a task stressor than low ability EI individuals). From this study, therefore, it seems that emotion-related cognitive abilities (i.e. dimensions of ability EI) are not particularly adaptive in situations characterized by task-stress.

A possible explanation for this finding relates to the operationalization of ability EI in the MSCEIT. Importantly, the MSCEIT measures individuals’ abilities to perceive emotions, as well as their abilities to understand (theoretically) how emotions can be regulated. However, the MSCEIT does not measure the ability of individuals to actually regulate their own emotions. Although this difference might seem arbitrary it is not; knowing how to handle stress in theory, is different to actually coping with stress when the situation arises. For this reason, we suggest that trait EI might be more relevant in the prediction of adaptive coping outcomes in the context of task-stress. As noted previously, trait EI (particularly when operationalized using the TEIQue-SF) involves emotional self-efficacy and self-reported emotional regulation abilities (example items from the TEIQue include: “I’m usually able to control my emotions when I want to” and “on the whole, I’m able to deal with stress”). From this perspective, there is clear alignment between emotional attributes related to trait EI construct and what is theoretically required in high-stress situations. Thus, we argue that coping with task induced stress is an appropriate context in which to assess the construct validity of the TEIQue-SF.

Existing research on trait EI and task stress provides some support for the idea that the trait form of EI (assessed using the full version of the TEIQue-SF), is indeed beneficial in the context of short-term stressors. In particular, a laboratory study focusing on the relationship between scores from the French version of the Trait Emotional Intelligence Questionnaire (TEIQue; Petrides, Pita, & Konkinaki, 2007) and mood deterioration following exposure to a task-stressor, demonstrated that trait EI moderated the impact of task stress on mood deterioration (Mikolajczak, Petrides, Coumans, & Luminet, 2009). Additionally, a study focusing on the effects of trait EI, intuition, and deliberation on exam performance (Laborde, Dosseville, & Scelles, 2010) demonstrated that trait EI as measured using the TEIQue, was associated with performance on a laboratory based multiple choice exam as well as relatively low levels of negative affect following the exam. Furthermore, scores from the TEIQue have been found to predict individual differences in the stress response as measured using change in heart rate variability on stress exposure (Laborde, Brull, Weber, & Anders, 2011).

1.4. Current Research

As noted previously, existing research on the validity of the TEIQue-SF in the context of stress is based primarily on self-report, general, trait-oriented measures of
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coping. Consequently, the evidence for the validity of the TEIQue-SF in the context of stress is limited. In this study, we assess the validity of the TEIQue-SF, by exploring the relationships between the TEIQue-SF and coping outcomes in the context of task-induced stress. Consistent with broader literature (e.g., Lazarus, 1993; Matthews et al., 2006), we suggest that effective coping involves 1) the adoption of an effective coping strategy (i.e., high problem-focused, adaptive levels of emotion-focused coping), 2) adequate performance on the stressful task, and 3) desirable post-task affect levels (i.e., high positive affect, low negative affect). We therefore focus on each of these components of effective coping in our hypotheses related to the validity of the TEIQue-SF, which we specify in the next few paragraphs.

Our first set of hypotheses relates to the incremental validity of the TEIQue-SF in the context of task-induced stress. As noted previously, research indicates that trait EI, when operationalized using the TEIQue-SF, has incremental validity over the Big Five in the prediction of trait-like measures of emotion-focused coping (Petrides, Pita, & Kokkinaki, 2007; Siegling et al., 2015), but this relationship has not been adequately examined in the prediction of coping with task-stress. It is hypothesized here that the TEIQue-SF will be a positive, unique, predictor of emotion-focused coping. Theoretically, this measure of trait EI should predict emotion focused coping: those who score high in the TEIQue-SF have high dispositional levels of self-efficacy and emotional control, and consequently should be able to regulate negative emotions when faced with a stressor. Consistent with this, Lazarus and Folkman (1984) specify perceived emotional control as a precursor to emotion focused coping in their transactional model of stress and coping.

**H1a.** The TEIQue-SF will predict emotion-focused coping when controlling for the Big Five dimensions of personality.

It is also hypothesized that the TEIQue-SF will be a positive, unique predictor of problem-focused coping. As noted above, problem focused coping is utilized when individuals feel that something constructive can be directly done to alter the source of their stress (Folkman & Lazarus, 1980; Lazarus & Folkman, 1984). Since the TEIQue incorporates self-efficacy and optimism, it follows that trait EI when operationalised using the TEIQue-SF, will enhance the likelihood that individuals will appraise a stressor as something that they can influence or control. Those who score low on the TEIQue-SF will likely be much more pessimistic about whether they can influence a stressor, and consequently be less likely to engage in problem-focused coping. This hypothesis is consistent with research in sport psychology, which has shown that scores from the TEIQue are associated with task-oriented (problem-focused) coping in table tennis players exposed to stressful situations (Laborde, You, Dosseville, & Salinas, 2012). It is also consistent with research demonstrating relationships between scores from the TEIQue-SF and retrospective measures of problem-focused coping (Laborde et al., 2014) and ‘typical’ measures of problem-focused coping (Petrides, Pita, & Kokkinaki, 2007).

**H1b.** The TEIQue-SF will predict problem-focused coping when controlling for the Big Five dimensions of personality.

Our second set of hypotheses was designed to test the construct validity of the TEIQue-SF, by testing theoretically derived models of the relationship between trait EI (operationalized with the TEIQue-SF) and coping outcomes in the context of task-
based stressors. Specifically, we investigate whether the TEIQue-SF predicts task performance and post-task affect through emotion-focused channels (i.e., reducing worry) and problem-focused channels (i.e., applying problem-focused strategies such as goal-setting) as would be expected based on theory. We also investigate the possibility that scores from the TEIQue-SF predict different coping outcomes through different mediators as also possible based on theory (i.e., does the TEIQue-SF predict task performance via problem-focused channels, but predict affect via emotion-focused channels?). Results related to these hypotheses therefore will allow us to further assess the construct validity of the TEIQue-SF.

First, we hypothesize that the TEIQue-SF should predict post-task affect via both emotion-focused coping and problem-focused coping. Theoretically, it follows that individuals with high levels of trait EI will adopt emotion-focused and problem-focused coping styles when exposed to a task stressor, and these adaptive coping styles will account for the relationship between trait EI and post-task affect. Indeed, consistent with H1a, we expect that individuals who score high on the TEIQue-SF should successfully regulate their emotions when confronted with a stressor and consequently engage in adaptive levels of emotion-focused coping. Consistent with H1b, we also expect that individuals who score high on the TEIQue-SF should perceive the stressor to be “manageable,” causing them to engage in problem-focused coping. We then expect these adaptive coping styles to result in enhanced post-task affect (i.e., high positive affect, low negative affect). Emotion-focused coping should enhance affect, because, as noted previously, emotion-focused coping is primarily concerned with the effective regulation of negative emotions evoked by a situation or threat (Lazarus & Folkman, 1984). Problem-focused coping should also enhance affect, because this appraisal of a stressor as “manageable” should theoretically reduce anxiety and other negative emotions surrounding the stressor. Consistent with this, emotion-focused coping has been found to mediate trait EI (measured using the adolescent version of the TEIQue-SF) in the prediction of self-harm, suggesting that trait EI is an indirect predictor of outcome variables via emotion focused coping (Mikolajczak, Petrides, & Hurry, 2009).

H2a. The TEIQue-SF will indirectly predict post-task affect (high positive affect, low negative affect) via the mediating effects of both emotion-focused and problem-focused coping.

Second, we hypothesize that the TEIQue-SF should predict performance via both emotion focused coping and problem focused coping. Consistent with the previous hypothesis, it follows that individuals who score highly on the TEIQue-SF will adopt emotion-focused coping and problem-focused coping styles, which should account for the relationship between scores on the TEIQue-SF and task-performance. Theoretically, emotion-focused coping should enhance performance, because those who can control their emotions are more likely to remain calm, and consequently devote their cognitive resources to the task at hand (also see Matthews et al., 2006). We also expect that problem-focused coping will enhance task performance, because problem focused coping incorporates a number of strategies known to underlie good performance on complex tasks (e.g., planning and goal setting).

H2b. The TEIQue-SF will indirectly predict task performance via the mediating effects of both emotion-focused and problem-focused coping.
As noted previously, results relating to the second set of hypothesis will allow for an assessment of construct validity of the TEIQue-SF that overcomes many of the limitations from previous research on this measure.

2. Method

2.1. Participants

Overall, 225 participants (89 males, 136 females, \( M_{\text{age}} = 23.54 \) years, age range: 18-50 years) took part in the current study. Of these participants, 145 took part in the main study, whereas 80 participated in the pilot study (as described later). An independent-samples t-test and Chi\(^2\) analysis indicated that the two samples did not significantly differ in terms of age, \( t(223) = 1.40, p = .16 \), and gender (\( \chi^2(1, N = 225) = .32, p = .32 \)). Eligible participants were 18 years or over and were recruited from a large, Australian university. Participants were notified about the study via the first year university participant pool, as well as official course Facebook pages. Participants from the first year pool were offered course credit for participation. Participation for these students was voluntary, in that students had the option to obtain course credit via alternative means. All participants were employed on part-time or full-time bases.

2.2. Behavioral Task

The timed, difficult Tower of Hanoi (TOH) task was used in this study primarily to induce task-stress. It was a computerized version of the mathematical TOH puzzle developed by Edouard Lucas in 1883. To solve the puzzle, people are required to transfer different sized discs over three “towers” but must follow several rules designed to make the task more challenging (i.e., discs must be arranged in ascending order, larger discs cannot be placed over smaller discs, and only one disc can be moved at a time). In this study, participants were given an online version of this puzzle, and were instructed to complete it as many times as possible in two minutes. During the task, the message “Work as fast as you can, you are being timed!” was constantly displayed on the screen.

This task was chosen as it meets our definition of being a task stressor, that is, a short-term, challenging task, likely to induce a temporary state of stress. We believed that this task in particular was appropriate, because consistent with Lazarus and Folkman’s (1984) transactional model, the task requirements/demands of this particular stressor could be appraised by some as exceeding their resources. Indeed, this appraisal likely occurred in the current study because, although participants were instructed to complete the puzzle “as many times as possible,” a significant proportion of the sample (23%) were unable to complete the task even once, with a further 47% able to complete the task only once.

Pilot work. To assess whether the TOH puzzle is effective at eliciting stress (in terms of negative affect) and can therefore be considered a task-stressor, a brief validation study was conducted. The validation study utilized 80 participants (28 males, 52 females) who were randomly allocated to either the experimental or control condition. In the experimental condition, participants completed the PANAS twice; once before and once after the TOH puzzle. In the control condition, participants also completed the PANAS twice; once before and once after a filler task unrelated to the current study. The control task was the 20 item Attentional Control Scale (Derryberry
& Reed, 2002) which was deemed to be largely unrelated to the constructs in this study and not theoretically likely to impact negative affect or stress in the short term. An example item from this questionnaire is “It is easy for me to read or write while I’m also talking on the phone” (response options ranging from 1 ‘almost never’ to 4 ‘always’). It was expected that the TOH would induce a mild stress state in participants, and consequently, that participants in the TOH group would experience a greater increase in negative affect across the two measurements compared to participants in the control condition. To test for this effect, we conducted a mixed subjects ANOVA, specifying ‘time’ as the repeated measures factor and ‘condition’ as the between measures factor. Consistent with our expectations, we found a significant time by condition interaction, $F(1, 78) = 12.96, p = .001$, indicating that participants who were exposed to the stressor reported a significantly greater increment in negative affect (mean change $= 2.73, \text{SD} = 4.30$) compared with participants who were in the filler condition (mean change $= -.23, \text{SD} = 2.88$).

2.3. Measures

**Trait Emotional Intelligence.** The Trait Emotional Intelligence Questionnaire – Short Form (TEIQue-SF; Petrides, 2009) was used in this study. It is a 30-item, self-report questionnaire designed to measure global trait EI. This questionnaire uses a 7-point scale, ranging from 1 (completely disagree) to 7 (completely agree). An example item is “I can deal effectively with people.” The TEIQue-SF provides reliable global trait EI scores. This measure of trait EI has been thoroughly researched (e.g., Cooper & Petrides, 2010; Perera, 2015) and has been found to have good psychometric properties. The TEIQue-SF had an internal reliability of $\alpha = .88$ in the current study. The TEIQue-SF can be accessed from [www.psychometriclab.com](http://www.psychometriclab.com).

**The Big Five personality traits.** The NEO-IPIP (Goldberg et al., 2006) is a 50-item measure of the Big Five personality traits (neuroticism, extraversion, openness to experience, agreeableness and conscientiousness). It uses a 5-point scale, ranging from 1 (very inaccurate) to 5 (very accurate). An example item is “I am the life of the party.” The NEO-IPIP is widely used and freely available online ([http://ipip.ori.org/](http://ipip.ori.org/)). The NEO-IPIP has been shown to have good construct validity and internal reliability (Lim & Ployhart, 2006). In the current study all scales had internal reliabilities greater than $\alpha = .70$, except for openness which received an internal reliability of $\alpha = .65$.

**Coping.** The Coping Inventory for Task Stressors (situational version CITS-S; Matthews & Campbell, 1998) was used for the immediate post-task assessment of coping. It consists of 21 items that relate to the overall question “Think about how you dealt with any difficulties or problems that arose while you were performing the task you have just performed... Please indicate how much you used each option, specifically as a deliberately chosen way of dealing with problems.” It has three subscales; task/problem-focused coping (“I worked out a strategy for successful performance”), emotion-focused coping (“I blamed myself for not doing better”), and avoidance coping (“I stayed detached or distanced from the situation”). Each subscale consists of seven items and requires participants to respond on a 5-point scale, ranging from 0 (not at all true) to 4 (extremely true). Since high scores on the emotion-focused coping subscale of the CITS-S indicate maladaptive emotional
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coping (e.g., “I worried about my inadequacies”), scores on this scale were reversed in this study. High scorers in this study therefore are individuals who can effectively regulate their emotions when faced with stress and do not tend to use maladaptive emotions (e.g. worry, self-blame) to cope with stress. Internal reliabilities on this measure have been found to range between 0.84 and 0.86 (Matthews & Campbell, 1998). In the current study emotion focused coping had an internal reliability of $\alpha = .91$ and problem focused coping had an internal reliability of $\alpha = .86$.

**Performance.** Performance on the TOH was operationalized as the number of completions of the puzzle. Since the TOH is a complex task, repeat completions of the puzzle in a short time period is very challenging. Although a difficult puzzle, scores on this variable did not violate normality assumptions, with skewness of .38 (SE = .20) and kurtosis of -.42 (SE = .40).

**Affect.** The Positive and Negative Affect Schedule – Expanded Form (PANAS-X; Watson & Clark, 1994) is a widely used measure of affect containing 60 items. The measure uses a 5-item likert-type response scale. The two higher order factors of positive affect and negative affect were used in this study. The scales have been found to have high internal consistency reliabilities (Watson & Clark, 1994). The alpha reliability for positive affect in this study was $\alpha = .88$ and for negative affect was $\alpha = .88$.

2.4. Procedure

Participants were provided with a web link via email from which they accessed the questionnaires and TOH task. All measures and the task were administered online, using the CYMEON cognitive online laboratory (Jackson, 2010) and took approximately 20 minutes to complete. The CYMEON online laboratory was deemed an appropriate platform for data collection in this study, because research has demonstrated that it produces equivalent results to traditional, pencil and paper data collection methods (Fraser & Boag, 2010). More generally, research has demonstrated that behavioral and questionnaire data collected online (regardless of whether participants are required to be in a computer lab, or a location of their choosing) is largely equivalent to face-to-face methods (see for example Casler, Bickel & Hackett, 2013; Horton, Rand & Zeckhauser, 2011).

Upon accessing the online laboratory, participants first provided their age and gender. Participants then completed the NEO-IPIP and TEIQue-SF questionnaires followed by the computerized version of the TOH Task. Upon completion of the task, participants completed the situational version of the CITS-S, which measured the strategies participants used as a deliberate way of coping with the TOH task. Participants then completed the PANAS which assessed their state levels of positive and negative affect following the task. Prior to data collection, the study had received full ethical approval from the relevant university ethics committee.

3. Results

3.1. Descriptive Statistics

Table 1 outlines descriptive statistics, psychometric properties, and correlations of the focal variables used in this study. Several patterns are noteworthy. First, the TEIQue-SF showed a pattern of moderate and fairly equal correlations ranging from .36 to .53 with each of the NEO-IPIP scales. Second, the problem-
focused coping scale (CITS-S) was the only significant correlate of task performance. Third, while the emotion-focused coping scale from the CITS-S had weak to moderate correlations with both the NEO-IPIP scales and the TEIQue, such correlations were close to zero for the problem-focused coping scale from the CITS-S.

Table 1.
Means, Standard Deviations, Reliability Coefficients and Bivariate Correlations of Focal Variables used in this Study (N = 145).

|                | Mean | SD   | Alpha | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |
|----------------|------|------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Baseline Traits |      |      |       |     |     |     |     |     |     |     |     |     |     |     |
| 1. Trait EI     | 150.57 | 20.33 | .88   |     |     |     |     |     |     |     |     |     |     |     |
| 2. Extraversion  | 33.25  | 6.64  | .86   | .47**|     |     |     |     |     |     |     |     |     |     |
| 3. Agreeableness| 39.23  | 4.98  | .79   | .45**| .16' |     |     |     |     |     |     |     |     |     |
| 4. Conscientiousness | 34.51  | 5.24  | .76   | .36**| -.02 | .24**|     |     |     |     |     |     |     |     |
| 5. Neuroticism   | 27.32  | 6.30  | .86   | -.53**| -.31**| -.19'|-.13 |     |     |     |     |     |     |     |
| 6. Openness      | 34.98  | 4.43  | .65   | .38**| .34**| .24**| .06  | .13 |     |     |     |     |     |     |
| Responses to Stressor Task |      |      |       |     |     |     |     |     |     |     |     |     |     |     |
| 7. Problem-Focused Coping | 16.83  | 5.72  | .86   | .05  | -.02| .04 | .14  | .04 | .05 |     |     |     |     |     |
| 8. Emotion-Focused Coping | 8.58   | 7.18  | .91   | .44* | -.24**| .20' | .23**| -.34**| .14 | -.12 |     |     |     |     |
| 9. Negative Affect | 17.99  | 8.17  | .84   | -.25**| -.12 | -.19'|-.03 | .27** | -.19'| .05 | .30 |     |     |     |
| 10. Positive Affect | 27.80  | 9.69  | .88   | .31**| .22**| .03 | .20' | -.18 | .15 | .30**| .05 | .22**|     |     |
| 11.TOH Task Performance | 1.15   | .85   | -.09  | -.01 | -.08| -.03| -.03 | -.02 | .35**| .14 | -.12 |-.09 |     |

Note. *p<.05. ** p<.01.

3.2. Tests of Hypotheses
The first set of hypotheses (H1a & H1b) stated that the TEIQue-SF would predict problem-focused and emotion-focused coping, when controlling for the NEO-IPIP scales. Two hierarchical multiple regression analyses were conducted to test these hypotheses. Age and gender were controlled in each analysis to rule out possible confounding effects. The results for these analyses are summarized in Table 2.
### Table 2.
*Multiple Correlation Coefficients (R), Standardized Regression Coefficients (β) and Squared Semi-Partial Correlations (sr²) for each Predictor Variable at each step of Two Hierarchical Multiple Regression Analyses (N=145)*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Emotion-Focused-Coping</th>
<th>Problem-Focused Coping</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>β (SE)</td>
<td>sr²</td>
</tr>
<tr>
<td><strong>Step 1</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>.20* (.08)</td>
<td>.04*</td>
</tr>
<tr>
<td>Gender a</td>
<td>.06 (.08)</td>
<td>.00</td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>.15 (.08)</td>
<td>.02</td>
</tr>
<tr>
<td>Gender</td>
<td>.07 (.08)</td>
<td>.00</td>
</tr>
<tr>
<td>Extraversion</td>
<td>.14 (.09)</td>
<td>.02</td>
</tr>
<tr>
<td>Agreeableness</td>
<td>-.03 (.09)</td>
<td>.00</td>
</tr>
<tr>
<td>Conscientiousness</td>
<td>.18* (.08)</td>
<td>.04*</td>
</tr>
<tr>
<td>Neuroticism</td>
<td>-.26** (.08)</td>
<td>.07**</td>
</tr>
<tr>
<td>Openness</td>
<td>.02 (.08)</td>
<td>.00</td>
</tr>
<tr>
<td><strong>Step 3</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>.13 (.08)</td>
<td>.02</td>
</tr>
<tr>
<td>Gender</td>
<td>.02 (.08)</td>
<td>.00</td>
</tr>
<tr>
<td>Extraversion</td>
<td>.07 (.09)</td>
<td>.00</td>
</tr>
<tr>
<td>Agreeableness</td>
<td>-.03 (.09)</td>
<td>.00</td>
</tr>
<tr>
<td>Conscientiousness</td>
<td>.11 (.08)</td>
<td>.01</td>
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<tr>
<td>Neuroticism</td>
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<td>.02</td>
</tr>
<tr>
<td>Openness</td>
<td>-.02 (.08)</td>
<td>.00</td>
</tr>
<tr>
<td>Trait EI</td>
<td>.30* (.12)</td>
<td>.04*</td>
</tr>
</tbody>
</table>

*Note.* *p<.05. **p<.01.

aBased on male = 1 and female = 2

Consistent with H1a, the TEIQue-SF was found to have incremental validity over the NEO-IPIP scales in the prediction of emotion-focused coping. In step 1 of the first hierarchical multiple regression analysis, age and gender were found to account for a significant 4.6% of the variance in emotion-focused coping, \( R^2 = .05, F(2,142) = 3.42, p = .035 \). In step 2, extraversion, conscientiousness, openness, neuroticism, and agreeableness from the NEO-IPIP were found to account for an additional 16.1% of the variance in emotion-focused coping, \( \Delta R^2 = .16, \Delta F(5, 137) = 5.55, p < .001 \). In step 3, the TEIQue was added to the model, and accounted for an additional 4% of the variance in emotion-focused coping, \( \Delta R^2 = .04, \Delta F(1, 136) = 6.13, p = .015 \). The TEIQue was actually the only significant predictor of emotion-focused coping at the final step of the model, as all other predictors were no longer significant once trait EI was added to the model. Combined, the eight predictor variables explained 24% of the variance in emotion-focused coping, \( R^2 = .24, \) adjusted \( R^2 = .20, F(8,136) = 5.40, p < .001 \). When the order of predictors was reversed (i.e. all NEO-IPIP scales added at the final step of the hierarchical regression) the NEO-IPIP scales were not found to explain incremental validity in emotion-focused coping over the TEIQue, \( \Delta R^2 = .03, \Delta F(5, 136) = .93, p = .46 \).
The results were not consistent with H1b; the TEIQue was not a significant, unique predictor of problem-focused coping at the final step of the hierarchical multiple regression analysis (see Table 2). The overall regression model, including the NEO-IPIP scales, was also not significant.

Our second set of hypotheses proposed that problem and emotion-focused coping (both operationalized using the CITS-S) would mediate the relationships between scores from the TEIQue-SF and positive/negative affect (PANAS) (H2a) and task performance (H2b). These hypotheses were tested using path analysis in AMOS, and bootstrapping was used to estimate the significance of indirect effects (using two-sided percentile based confidence intervals based on 1000 bootstrap samples). Since problem-focused coping was found to be unrelated to the TEIQue-SF in the test of H1b, it was not expected to be a mediator, but was nevertheless included in each path model (see Figure 1) to control for its effects on the DV’s. Three models (i.e., one for positive affect, one for negative affect, one for performance) were therefore tested using path analysis.

**Figure 1.** Results from path analyses testing the hypothesized relationships between trait EI (TEIQue-SF), coping strategies and coping outcomes. Scores on the TEIQue-SF were expected to indirectly predict coping outcomes via coping styles. Dashed arrows (and respective standardized path estimates) represent non-significant paths that were tested, but that were not included in the final models.
Collectively, these analyses provided partial support for H2a and H2b. First, regarding H2a, the TEIQue-SF was found to indirectly predict negative affect (PANAS) via the emotion-focused coping scale of the CITS-S (indirect effect = -.13, p = .003), with significance assessed via bootstrapping. This can be regarded as a full mediation, because the significant total effect between the TEIQue-SF and negative affect (total effect = -.26, p < .05) was no longer significant (direct effect = -.14, p = .10) after controlling for the mediator (emotion focused coping). Furthermore, a Chi² difference test revealed that including a direct path between the TEIQue-SF variable and negative affect did not significantly improve the fit of the model (χ² (1) = 2.65, p = .10). This provides further support for full mediation, because it indicates that a direct path between the TEIQue-SF variable and negative affect is not required to produce optimal fit (Preacher & Hayes, 2008). In fact, such a relationship should not be included, as it results in a less parsimonious model.

In contrast, the TEIQue-SF did not indirectly predict positive affect via emotion-focused coping (indirect effect = .03 p = .40). As can be seen in Figure 1, this is because emotion focused coping was not a direct predictor of post-task positive affect. However the TEIQue-SF was a direct predictor of post-task positive affect (direct effect = .30, p < .001). Problem-focused coping was also found to directly predict positive affect (direct effect = .32, p < .001).

Second, regarding H2b, despite no initial, bivariate relationship between the TEIQue-SF and performance, trait EI was found to indirectly predict task performance via emotion-focused coping, when controlling for problem-focused coping (indirect effect = .08, p = .007). Additionally, when controlling for the positive effects of both emotion and problem-focused coping on task performance (see figure 1), the TEIQue-SF became a negative predictor of task performance (direct effect = -.24, p = .005). The TEIQue-SF did not indirectly predict performance via problem-focused coping. However, as indicated in Figure 1, problem-focused coping was a direct predictor of task performance (direct effect = .37, p < .001).

4. Discussion

Previous research on the validity of the TEIQue-SF in the context of stress (e.g., Petrides, Pita, & Kokkinaki, 2007; Siegling et al., 2015) has demonstrated that scores on the TEIQue-SF are associated with adaptive coping styles in the context of stress. However, such research was limited in that it was based primarily on trait-like measures of stress and coping, and also relied on general, subjective measures of stress. In the current study, we sought to overcome these limitations by measuring coping strategies and outcomes in response to a task-based task stressor. We used this methodology to assess the incremental validity of the TEIQue-SF in the prediction of emotion-focused and problem-focused coping styles, and the construct validity of the TEIQue-SF by testing whether the mechanisms via which scores from the TEIQue-SF predict coping outcomes are consistent with theory.

This study revealed that the TEIQue-SF is an important predictor of coping with task-induced stress. The TEIQue-SF was found to be important even when controlling for the Big Five personality traits, as it had incremental validity in the prediction of emotion-focused coping (consistent with H1a). The TEIQue-SF however did not have incremental validity in the prediction of problem-focused
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coping (H1b). Additionally, the current study demonstrated the TEIQue-SF predicts adaptive levels of positive and negative affect in the context of task stress. In predicting negative affect, the TEIQue-SF operated indirectly via adaptive levels of emotion-focused coping. However in predicting positive affect, the TEIQue-SF operated directly (i.e. not via problem-focused or emotion-focused coping). Hypothesis 2a was therefore partially supported. This study has also revealed that the TEIQue-SF indirectly predicts performance, via emotion-focused coping. However this was not a simple mediation, in that there was no initial, bivariate relationship between the TEIQue-SF and performance. Instead, we found that the TEIQue-SF indirectly predicted performance via emotion-focused coping, only when controlling for problem-focused coping. Since problem-focused coping was not a significant mediator in this relationship, H2b was also partially supported.

Overall, the results described here provide support for the validity of the TEIQue-SF. In terms of incremental validity, results clearly demonstrate that the TEIQue-SF predicts emotion-focused coping when controlling for a measure of the Big Five personality traits. In terms of construct validity, results were largely consistent with how trait EI should theoretically impact coping and related outcomes in the context of task-stress. Theoretically, individuals high in trait EI should successfully regulate their emotions when confronted with a stressor and engage in adaptive levels of emotion-focused coping. Importantly, this ability to regulate emotions should explain why individuals high in trait EI tend to have better coping outcomes (in terms of affect and performance). Consistent with this, scorers TEIQue-SF were associated with post-task negative affect and task performance via the mediating effect of emotion-focused coping.

We note however that our hypotheses did not receive complete support, in that problem-focused coping was not found to be a significant mediator of the TEIQue-SF in the prediction of coping outcomes. The results here are therefore slightly different from research utilizing trait-like measures of coping (e.g., Petrides, Pita, & Kokkinaki, 2007), and other retrospective measures (Laborde et al., 2014) which have shown unique relationships between scores from the TEIQue and problem-focused coping. Since the current study did not find even a small relationship between the TEIQue-SF and problem-focused coping (despite having sufficient power to do so), it is likely that, in the context of a task stressor, the TEIQue-SF will generally not predict problem-focused coping. Although unexpected, we do not believe this finding is problematic for the construct validity of the TEIQue-SF, because theoretically, emotion focused coping should be the primary mechanism via which trait EI exerts positive effects on coping outcomes.

One possibility for this different pattern of results relates to the small window of opportunity for coping available to individuals confronted with task-stress. When coping with chronic or long term sources of stress, individuals high in trait EI may simply have more time to formulate problem-focused coping strategies. Indeed this is likely when considering trait EI (as operationalized by the TEIQue-SF) incorporates self-efficacy and optimism, which enhances the likelihood that over time, individuals will appraise a stressor as something they can influence or control. We speculate that in the context of a task-stressor, which generally requires the immediate adoption of coping strategies, individuals high in trait EI may prioritize regulating their emotions...
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(emotion-focused coping) which in the short term, might occur at the expense of problem focused coping.

Although our primary focus was on the validity of the TEIQue-SF, we believe our results also have some theoretical implications regarding nature of the underlying relationship between the EI construct and stress. We found that the TEIQue-SF indirectly predicted post-task negative affect via emotion-focused coping, but directly predicted positive affect (i.e. not via either coping style). It seems therefore, that trait EI predicts low levels of negative affect in the context of a task stressor, because high trait EI individuals engage in adaptive levels of emotion focused coping in such situations. However, the beneficial effects of trait EI on post-task positive affect cannot be attributed to emotion focused coping. Instead, it seems that the positive mood experience by high trait EI individuals following the task was due to aspects of trait EI unrelated to adaptive coping (e.g. wellbeing, optimism). Overall therefore, these findings are consistent with the idea that trait EI is related to both positive and negative affect (Petrides & Furnham, 2003) and consequently support the construct validity of the TEIQue-SF, however we have shed some light on the mechanism/s via which this occurs in the context of task-stress.

4.1. Implications for Assessment and Practice

In addition to providing support for the validity of the TEIQue-SF, we believe these findings have several implications for assessment and practice, particularly when considered in combination with existing research demonstrating the link between the TEIQue-SF and coping with stress in general. First, because high scorers on the TEIQue-SF were found to have more desirable levels of affect directly following a stressful situation, it follows that the TEIQue-SF would be a useful assessment tool when selecting individuals to take on roles involving task stressors (e.g., employment decisions). All other things being equal, we believe that those scoring high on the TEIQue-SF (and consequently high on trait EI) will be more satisfied in roles largely characterized by task stress, and consequently will be better suited to such roles in the long term.

Second, because this study assessed construct validity by investigating the mechanisms via which the TEIQue-SF affects coping, the results can be used, albeit tentatively, to better assist individuals who cope poorly with task stress. For example, an individual who performs well in the context of task stress (high performance) and feels good about performing well (high positive affect), yet constantly reports being emotionally drained (high negative affect) likely has adaptive levels of problem-focused coping, but maladaptive levels of emotion-focused coping (stemming from low trait EI). This is consistent with our finding that negative affect follows maladaptive forms of emotion-focused coping. To help such an individual, we recommend he/she focuses specifically on improving emotional coping skills. Such a focus, combined with other interventions (e.g., modifying the individuals work requirements where possible) is likely to benefit low scorers on the TEIQue-SF in the long term.

4.2. Strengths and Limitations

The major strength of this study was our use of a computer-based, objectively manipulated task-based stressor to explore the validity of the TEIQue-SF. This is in contrast to the majority of research on the TEIQue (long and short forms) and coping,
that has primarily relied on trait-like measures of coping. The task stressor allowed us to measure task performance, affect, and self-reported coping strategies directly after the stressor was encountered. The clear drawback of this method, however, is the potential lack of generalizability to real life task stressors. However, given that previous research has demonstrated that the TEIQue-SF is related to self-assessments of adaptive coping (e.g., Perera & DiGiacomo, 2015), we nevertheless believe that the TEIQue-SF is uniquely important in real life stress situations. Additionally, since we used a cognitive stressor, the results of this study can strictly only be applied to cognitive task stressors performed under time pressure. We do not believe this substantially limits the generalizability of our findings however, because a large portion of stressful situations in the workplace are due to the perceived challenges of cognitive tasks which inevitably have deadlines. Nevertheless, we suggest that future research explore the validity of the TEIQue-SF in situations characterized by coping with non-cognitive task stressors.

In conclusion, although further research is needed in this area, our findings provide support for the validity of the TEIQue-SF when assessed in the context of coping with task-induced stress. We found that high scores on the TEIQue-SF correspond with adaptive levels of emotion focused coping, even when controlling for known predictors of stress and coping (i.e. the Big Five). The present study also investigated the mechanisms via which the TEIQue-SF predicts a range of stress related outcomes. Consistent with theory and therefore providing support for the construct validity of the TEIQue-SF, we found that emotion focused coping mediates the TEIQue-SF in the prediction of (low) negative affect in the context of task stress. Finally, our results have important implications for those experiencing stress as a result of exposure to cognitive stressors; our results indicate that emotion focused coping (which is associated with scores on the TEIQue-SF) is more important than problem-focused coping when it comes to managing the negative affect associated with task-stress.

5. References
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Roger, D., Jarvis, G., & Najarian, B. (1993). Detachment and coping: The construction and


