Personality and Individual Differences 120 (2018) 58–64

Contents lists available at ScienceDirect

Personality and Individual Differences

journal homepage: www.elsevier.com/locate/paid

Emotional intelligence and cortisol responses: Can laboratory findings be replicated in classrooms and using other EI measures?

Susan J. Wilbraham[a,*], Pamela Qualter[b], Mark P. Roy[c]

[a] University of Cumbria, United Kingdom
[b] The Institute of Education, University of Manchester, United Kingdom
[c] University of Central Lancashire, United Kingdom

ARTICLE INFO

Keywords:
Emotional intelligence
Stress
Cortisol
Mood
Ecological validity
Education
Assessment

ABSTRACT

Laboratory studies demonstrate negative relationships between emotional intelligence (EI) and cortisol responses (Mikolajczak, Roy, Luminet, Fillee & De Timary, 2007). The current study examined whether EI influenced stress reactivity in an applied setting, with students giving group oral presentations. Participants were either presenters (high stress condition) or observers (controls); cortisol and mood were measured within subjects at three time points (baseline, time 2 [20 min after onset] and time 3 [40 min after onset]). The stress manipulation successfully increased cortisol scores (AUCg and AUCi) in presenters. No significant relationships emerged between cortisol and either total EI or EI subscales, although the emotional control subscale predicted mood. Results may indicate that EI influences stress processes in some students but not others, they may reflect the study methods and EI measure used, or they may reflect the complexity of group assessments. Content validity of EI measures is a contentious issue and domain coverage varies between measures; coverage of the chosen EI measure may have influenced findings. Additionally, increasing ecological validity decreased experimental control, removing the ability to impose strict timings on saliva collection; potentially impacting on results. Alternatively, EI may have insufficient influence over group assessment to impact on physiological stress responses.

1. The relationship between emotional intelligence and stress in educational settings

1.1. The relationship between emotional intelligence, stress, and health

Emotional intelligence (EI) is a multifaceted construct which encompasses a range of emotional skills including emotion perception and expression, the understanding and analysing of emotion, reflective regulation of emotion, and emotional facilitation of thinking (Mayer & Salovey, 1997). When assessed via questionnaires and rating scales the construct is conceived as a constellation of emotional perceptions and referred to as 'trait emotional intelligence' (Petrides, Pita, & Kokkinaki, 2007). Past research has revealed that emotional skills are correlated with a range of physical health outcomes, for example emotion regulation has been found to be related to general health (John & Gross, 2004), while emotional expression has been found to improve immune responses (Petrie, Booth, Pennebaker, Davison, & Thomas, 1995). Furthermore, amygdalar activity has been found to predict cardiovascular disease, reportedly though increasing bone marrow activity and arterial inflammation (Tawakol et al., 2017). The relationship between EI and health has also been explored, and a number of studies have found that scores on trait emotional intelligence tests are predictive of self-reported health (Dawda & Hart, 2000; Day, Therrien, & Carroll, 2005; Extremera & Fernández-Berrocal, 2002; Mikolajczak, Luminet, & Menil, 2006; Slaski & Cartwright, 2002; Tsaousis & Nikolaou, 2005).

While past studies have provided evidence of a positive association between EI and health (Slaski & Cartwright, 2002; Tsaousis & Nikolaou, 2005), there is only a limited body of research that has sought to understand the paths by which emotional skill and understanding might protect health (Lumley, Stettner, & Wehmer, 1996). Research suggests that EI may promote better health through its action of moderating the relationship between stress and health (Mikolajczak et al., 2006), either through its influence on behaviour or physiology. Evidence supporting that notion includes findings of a negative relationship between EI and both self-reported feelings of stress (Landa, López-Zafra, Martos, & Aguilar-Luzón, 2008; Oginska-Bulik, 2005) and feelings of inability to control life events (Gohm, Corser, & Dalsky, 2005). Objective studies of stress responses have also explored the relationships between trait EI and physiological stress reactivity in controlled

* Corresponding author.
E-mail address: susan.wilbraham@cumbria.ac.uk (S.J. Wilbraham).

http://dx.doi.org/10.1016/j.paid.2017.08.021
Received 11 May 2017; Received in revised form 11 August 2017; Accepted 12 August 2017
Available online 18 August 2017
0191-8869/

laboratory settings, with results revealing trait EI is associated with less mood deterioration, and is a significant moderator of the relationship between stressor exposure and cortisol reactivity (Mikolajczak, Roy, Luminet, Fillée, & de Timary, 2007; Salovey, Stroud, Woolery, & Epel, 2002).

1.2. Emotional intelligence and stress in educational settings

Controlled laboratory studies have suggested that EI moderates the relationship between non-naturalistic stressors and cortisol reactivity (Mikolajczak, Roy, et al., 2007; Salovey et al., 2002), but that association has not been examined in real world settings. Although tightly controlled conditions create greater internal validity (i.e. reduce confounding factors) in studies exploring the potential association between trait EI and stress reactivity, it is also desirable to replicate findings in studies with high external validity (i.e. where the results of the study can be more readily generalised to the real world). It cannot be assumed that in real world settings people will respond to stressors in the same way as they would in a lab setting. For example, students who undertake oral presentations as part of course assessment are not passive recipients of this stressor: they can take steps to reduce feelings of stress by studying or practicing more. The amount of stress students perceive themselves to be experiencing can be conceived as a balance between the extent of the challenge they face, and the resources they believe themselves to have to meet the challenge (Lazarus & Folkman, 1984). This means that students can decrease the apparent magnitude of the stressor they face by increasing their capability, by engaging in positive self-talk about their ability, or through using positive frame of mind to decrease the perceived social consequences of task failure. If students can reduce the perceived magnitude of the stressor they face, then they are likely to reduce their corresponding physiological response.

EI includes both interpersonal and intrapersonal emotional skills, so it is reasonable to suggest that EI might be associated with the ability to create a positive attitude towards studying, public speaking practice, assessment, and assessment feedback. Skill with emotional control may help prevent difficult or unhelpful emotions from arising, while skill with emotion management may help individuals to tackle unhelpful emotions once they have arisen. EI is associated with creating positive thoughts and feelings, potentially including those towards study and thus, it may be predictive of reduced stress responses in educational settings. Indeed, EI has been found to be supportive of better educational achievement, moderating the relationship between cognitive ability and academic performance, and being negatively related to unauthorised school absence (Petrides, Frederickson, & Furnham, 2004). However, although EI might help to promote positive self-talk, conceivably appraisals that 'everything is fine' could be indicative of avoidant coping strategies. Although higher EI may include greater emotional control, and, therefore, an ability to reduce feelings of anxiety, a moderate level of perceived stress is useful in eliciting peak performance (Teigen, 1994). It is possible that perceived stress in the run up to a presentation assessment motivates some students to work harder or prepare more, and, thus, have reduced physiological responses on the day of assessment, despite having lower EI. Furthermore, although motivation is good for driving study behaviour, conversely, apathy or minimising the value of the assessment could reduce the emotional intensity a student experiences, and, thus, reduce the importance or significance of the perceived challenge they face. Negative attitudes could reduce stress responses by allowing students to minimise the perceived consequences of task failure. So, although high EI might be expected to be predictive of lowered stress responses, conversely so might the indifference or lack of engagement hypothetically associated with lower EI. For EI to demonstrate utility it needs to be able to predict stress reactivity against this complex backdrop of cognitive, emotional, and behavioural activity.

Past research on negative affective responses in controlled lab settings has reported higher trait EI to be related to lower mood deterioration (Mikolajczak, Roy, et al., 2007), reduced emotional reactivity (Mikolajczak, Luminet, Leroy, & Roy, 2007), and perceptions of stressors as less threatening (Salovey et al., 2002). Therefore, for students giving oral presentations it is likely to be beneficial to have higher EI. Past research has also reported specific aspects of emotional intelligence as being implicated in attenuating stress responses; in separate studies Salovey et al. (2002) found subscales measuring 'attention to emotions' and 'clarity of emotions' to be related to lowered cortisol responses. Meanwhile, Mikolajczak, Roy, et al. (2007) found that global trait EI scores, and EI subscales all displayed similar response patterns, being negatively related to cortisol at baseline, cortisol at peak, and increases in negative affect. However, these relationships need to be tested in a real world setting.

1.3. The present study

The current study sought to measure the association between trait EI and cortisol reactivity. In a meta-analysis, the conjunction of cognitive demand, motivated performance, and socially evaluative threat was associated with a fourfold higher effect size than a simple cognitive demand task (Dickerson & Kemeny, 2004); in the present study the assessed student presentations incorporate these features but in a naturalistic context. The first goal of this study was to explore the relationship between trait EI and salivary cortisol in students before and after oral presentations. The second goal of the study was to explore the relationship between trait EI and both tense and energetic mood in these students before and after their oral presentations.

2. Method

2.1. Design

A mixed design was used for the current study. Stress was operationalised on two levels: (1) high stress – participants giving oral presentations, and (2) controls – participants in the same group but who were watching rather than giving presentations. All participants gave repeated measures for both salivary cortisol and mood at three points in time (before the assessed presentations, 20 min after stressor onset, 40 min after stressor onset). The schedule of these data collection points follow recommendations based on meta-analysis, these timings being associated with the largest possible effect sizes (Dickerson & Kemeny, 2004). The relationships between Trait EI, mood, and cortisol reactivity were then investigated through correlational and regression analysis.

2.2. Participants

Participants were undergraduate students contacted through verbal announcements in lectures requesting they participate in a salivary cortisol study during the presentations they were due to give for course assessment. Ninety eight participants gave saliva samples for analysis, of these 4 participants had cortisol results which were discarded as unreliable, 3 gave saliva samples that were too small for analysis, and 2 failed to complete mood questionnaires.

Of the 89 cortisol participants used in analyses, 32 were non presenters (control condition) and 57 were presenters (high stress condition). Of the participants in the high stress condition, 15 (26.3%) were male and 42 (73.7%) were female; their ages ranged from 18 to 37 (mean 19.91, standard deviation 4.23). For the participants in the control condition, 5 (15.6%) were male and 27 (84.4%) were female; their ages ranged from 18 to 22 (mean 18.59, standard deviation 0.18). From an experimental perspective it would have been ideal to ask student participants to refrain from smoking, drinking alcohol, eating, or consuming caffeine for 2 h before the study, however as the stressor was an element of coursework it was not possible to control this. Therefore, food, caffeine, smoking, and alcohol were self reported by participants so that intake could be entered in analyses of cortisol outcomes as control variables.