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The role of trait emotional intelligence in emotion regulation and performance under pressure

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ABSTRACT

This study explored the role of trait emotional intelligence (EI) in emotion regulation and performance under pressure. Twenty-eight tennis players performed two series of 35 serves, separated by a pressure manipulation. Reaction to pressure was assessed using both subjective (self-report emotion questionnaire) and objective (cortisol secretion, tennis serve success) measures. The pressure manipulation was successful with observed increases in anxiety and decreases in self-confidence and tennis serve performance. Trait EI was found to predict cortisol secretion over state emotion measures. Performance under pressure was predicted by self-confidence and cortisol secretion, but not by trait EI. These findings provide some preliminary evidence that trait EI and cortisol secretion are important in athlete responses to pressure situations.

1. Introduction

Personality-trait-like individual differences have an important role in human performance under pressure (Allen, Greenlees, & Jones, 2011, 2013; Laborde, Breuer-Weissborn, & Dosseville, in press). However, whether individual differences contribute to performance directly, or rather act on other mechanisms such as emotion regulation, has received little empirical attention. In this study, we explore the role of trait emotional intelligence (EI) in emotion regulation and performance under pressure. Competitive pressure can lead to different emotional responses amongst which anxiety is often considered the most relevant, with stress forming part of anxiety according to the view of Lazarus (2000). Emotion regulation is the automatic or controlled use of strategies to initiate, display, maintain, or modify emotions (Gross & Thompson, 2007). We view here emotion regulation as encompassing stress regulation, again according to Lazarus' (2000) view.

Trait EI is defined as a constellation of emotional self-perceptions situated at the lower levels of personality hierarchies (Petrides, Pita, & Kokkinaki, 2007). It is now well established that trait EI has a positive effect on emotion regulation (e.g., Kotsou, Nelis, Grégoire, & Mikolajczak, 2011; Laborde, Brüll, Weber, & Anders, 2011; Mikolajczak, Roy, Luminet, Fillée, & de Timary, 2007). Much of the research on trait EI and emotion regulation has used self-report measures (e.g., Mikolajczak, Menil, & Luminet, 2007) and are therefore susceptible to what Mikolajczak, Roy, et al. (2007) have termed the "response bias pathway" (i.e., self-report measures associated with other self-report measures). Nevertheless, subsequent efforts have extended this research to include biological markers such as cortisol secretion (Kotsou et al., 2011; Mikolajczak, Roy, et al., 2007) and heart rate variability (Laborde et al., 2011). In particular, trait EI has been linked to a lower baseline in cortisol response prior to a stressful event (Mikolajczak, Roy, et al., 2007) and a lower increase of the LF/HF ratio of heart rate variability during a stressful event (Laborde et al., 2011). These two biological parameters reflect the activity of two systems that work in parallel when an individual is facing stress: the sympathetic-adrenomedullary system (SAS) and the hypothalamic-pituitary-adrenocortical axis (HPA) (Laborde et al., 2011; Mikolajczak, Roy, et al., 2007). Although both systems work in parallel, their temporal patterning is different such that the effects of the SAS system are much faster than those of the HPA system (neural vs. endocrine). In the current research, we focus on the HPA system in part to avoid the aforementioned "response pathway bias",

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taking salivary cortisol as our emotion regulation marker. An effective emotion regulation is reflected in a lower increase of cortisol secretion when an individual is facing pressure (de Veld, Riksen-Walraven, & de Weerth, 2012).

Recent studies have successfully extended the research on trait EI to include biological markers related to emotion regulation (Laborde et al., 2011; Mikolajczak, Roy, et al., 2007). However, so far they have not considered whether trait EI explains unique variance in the emotional biological parameters under study, in comparison to an emotional state that an individual is currently experiencing (i.e., state emotion). Thereby, they did not explore whether the biological parameters that are associated with emotion regulation reflect an underlying disposition of the individual or a situation specific response to current competitive pressure. Clarifying this ambiguity is important, not only for theoretical advancement in the field of individual differences, but because uncovering the respective contribution of trait and state emotions in pressure situations would provide clinical practitioners with valuable information on human behavior in such contexts (Laborde, Raab, & Dosseville, in press). It has been shown previously that trait EI predicts cortisol secretion over other trait measures (Mikolajczak, Roy, et al. (2007) and that state emotions relate to cortisol secretion before a stressful event (Filaire, Alix, Ferrand, & Verger, 2009). However, the role of trait EI alongside state emotions has yet to be explored. To understand whether one or two separate processes are at work, this study sought to explore the independent and interrelated variance of trait EI and state emotions on cortisol secretion in a pressure situation.

A second aim of this study was to explore the contribution of trait EI to athletic success in an ecologically valid performance environment. To date, research exploring trait EI and biological markers of emotion regulation (Laborde et al., 2011; Mikolajczak, Roy, et al., 2007) have not included a performance measure related to the stressful task. Trait EI has an important role in long-term achievement (e.g., Agnoli et al., 2012; Petrides, Niven, & Mouskounti, 2006; Sanchez-Ruiz, Mavroveli, & Poullis, 2013) but the contribution of trait EI to short-term performance under pressure has rarely been explored (Laborde, Dosseville, & Scelles, 2010). There is evidence that trait EI is important for ballet dancing ability and length of musical training (Petrides et al., 2006) as well as to academic performance (Sanchez-Ruiz et al., 2013) in combination with cognitive ability (Agnoli et al., 2012). These effects are generally explained by a higher ability to motivate oneself toward a long-term goal and to the daily effect of adaptive emotion regulation strategies. To the best of our knowledge, only one study explored the contribution of trait EI to short-term performance under pressure (Laborde et al., 2010). In this study, undergraduate students watched a videotaped lecture and were required to answer a number of questions related to the content of that lecture. Findings showed that trait EI was positively associated with performance scores obtained by the students and that trait EI had a protective role regarding negative affect experienced during the task. Explanations put forward to describe this effect, in addition to the regulation of negative affect, was that trait EI promotes the use of more adaptive coping strategies (Laborde, You, Dosseville, & Salinas, 2012) and that students appraised the stressful task as a challenge rather than a threat (Mikolajczak & Luminet, 2008).

In addition to the potential contribution of trait EI to short-term performance, the current study also considers the relative contribution of state emotions and cortisol secretion to performance under pressure. There is good evidence that competition emotions contribute to athletic performance (Laborde, Raab, et al., in press) and anxiety is often considered the most influential emotion (Craft, Magyar, Becker, & Feltz, 2003). There is also some emerging evidence that high cortisol levels are related to poor performance in athletic tasks (Doan, Newton, Kraemer, Kwon, & Scheet, 2007). The current study aimed to build on this research by considering the contribution of trait EI, state emotions and cortisol secretion to performance in a high pressure situation.

Pressure manipulation is an important component of the current study. In the past, cortisol secretion has been assessed in the context of a real competition that, although having the advantage of greater ecological validity, makes it difficult to capture emotional and physiological responses that are exclusive to competitive pressure (e.g., Filaire et al., 2009; Suay et al., 1999). In the current study, we use a standardized pressure induction – namely the second part of the Trier Social Stress Test (TSST; Kirschbaum, Pirke, & Hellhammer, 1993) – to generate a pressure environment. The second part of the TSST is a mental arithmetic task that has been shown to increase cortisol secretion (Laessle & Hansen-Spinger, 2010).

In short, this study explores the independent and interrelated variance of trait EI and state emotions (cognitive and somatic anxiety) on a biological marker of emotion regulation (cortisol secretion) during a pressure situation. The study also explores the contribution of trait EI, state emotions, and cortisol secretion to athletes' performance under pressure (changes in performance following a pressure manipulation). It was hypothesized that both trait EI and state emotions would predict cortisol secretion during the pressure situation. However, no specific hypotheses were made regarding independent or shared variance. It was also hypothesized that trait EI, state emotions and cortisol secretion would predict athletic performance under pressure. However, as individual differences tend to have long-term rather than short-term effects (for a review, see Laborde, Breuer-Weissborn, et al., in press) it was expected that state emotions and cortisol secretion would be most strongly related to performance under pressure.

2. Methods

2.1. Participants

Twenty-eight near-expert tennis players (13 females, mean age = 23.88 years, range = 16–36 years) took part in the experiment. They had been involved in tennis practice since a mean of 16.69 years (SD = 5.82) and were training a mean of 4.00 h per week (SD = 2.10). The participants were all non-smokers and had no history of endocrine disorders. There was also no reported drug abuse and the participants were not on any medication. In addition, the participants were not familiar with the TSST (see Section 2.2.5).

2.2. Materials

2.2.1. CSAI-2

To measure changes in anxiety, we used the Competitive State Anxiety Inventory-2 (CSAI-2; Martens, Vealey, Burton, Bump, & Smith, 1990). For this measure, participants are required to answer 12 questions that assess three anxiety components: somatic anxiety (e.g., "at this moment, my body feels tense."), self-confidence (e.g., "at this moment, I'm confident I can meet the challenge."), and cognitive anxiety (e.g., "at this moment, I am concerned about choking under pressure."). Each question is rated on a four-point scale from 1 (not at all) to 4 (very much). Reliability coefficients for the three subscales ranged from .79 to .82.

2.2.2. TEIQue

The German version of the Trait Emotional Intelligence Questionnaire (TEIQue; Freudenthaler, Neubauer, Gabler, Scherl, & Rindermann, 2008) was used to measure trait EI. This questionnaire comprises 153 items, 15 subscales, four factors (well-being,