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Divergent thinking and stress dimensions

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ABSTRACT

This study examines the role of the stress state dimensions of Engagement, Distress, and Worry before and during a divergent thinking (DT) task, while controlling for trait emotional intelligence (trait EI). The sample consisted of 175 university students in Technical and Natural Sciences, Social Sciences and Arts. Trait EI factors (Wellbeing, Emotionality, Sociability, and Self-control) correlated positively with Engagement (pre- and within-task), and negatively with Distress (pre- and within-task) and Worry (pre-task). Regression of DT scores showed incremental validity of post-task stress state dimensions over trait EI and pre-task stress state dimensions, whereby the individual predictors were Distress (negative) and Engagement (marginal and positive). Finally, ANOVAs revealed that within-task Distress scores were associated with high DT in the Arts group, but low DT in the other groups. From the results, a possible task-to-state as well as state-to-performance relationship is inferred, and the domain specificity of the affect-creativity relationship is discussed. Implications for the educational settings and the study and assessment of these two constructs are presented.

1. Introduction

The construct of creativity is complex and multi-componential (Kim, 2006). To date, one widely accepted definition is that of creativity as a way of thinking that leads to novel and useful products (e.g., Mumford, 2003). Notwithstanding, there has been extensive empirical investigation of the cognitive elements of creative activity, but less research efforts have been dedicated to its affective (trait and state) components (Csikszentmihalyi, 1990; Russ, 1999; Shaw & Runco, 1994). In the educational context, these components are essential. Effective educational practices do not only focus on cognitive abilities, but also on emotional and motivational aspects (e.g., Runco, 2014).

It is generally assumed that positive affect fosters creativity (e.g., Estrada, Isen, & Young, 1994; Lyubomirsky, King, & Diener, 2005), but the role of negative states such as stress remains controversial (e.g., George & Zhou, 2002). A meta-analysis conducted by Baas, De Dreu, & Nijstad (2008) suggests that, in fact, positive and negative mood both influence creativity, but in different ways, and through different routes. In the same line, Kaufmann (2003) argues that positive and negative moods may affect different dimensions of creativity. Teachers and counsellors can make use of this information and aim to

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fulfil their students' creative potential through an individualized teaching approach. For example, one way to enhance the creativity of students might be to facilitate opportunities to practice creative thinking under different conditions, including a variety of emotionally-charged situations.

In the present study, we used divergent thinking (DT) as indicator of creativity. Guilford (1956) considered the 24 components of DT in its structure of intelligence as essential for the psychometric definition of creative thinking. DT is defined as the kind of thinking that results in several ideas, solutions or products, in contrast to convergent thinking, which leads to one correct answer, as in the case of traditional ability tests (Plucker & Renzulli, 1999). DT tests are among the most widely used tests to assess creativity, they measure idea-generation skills, and in particular fluency as well as other creativity dimensions such as flexibility, originality and elaborateness (e.g., Torrance, 1990).

Many researchers consider DT as a necessary, but not sufficient, element of creativity, because creativity not only implies the generation of novel ideas, but also the ability to evaluate them so they are appropriate and valuable (e.g., Runco, 2008). In the same line, Zeng, Proctor and Salvendy (2011) stated that creativity cannot be reduced to original thinking. However, DT tests have shown certain predictive validity (e.g., Furnham, Batey, Anand, & Manfield, 2008) ad discriminant and convergent validity (e.g., Dollinger, Urban, & James, 2004), and, in sum, research has shown that DT is a valid indicator of creative potential in various contexts (e.g., Batey, Rawles, & Furnham, 2009).

2. Affect-related traits and states and their link to creativity

Two main approaches to the creativity-affect link can be identified in the literature. The first one studies creativity in relation to affect-related personality traits and the second one does so in relation to affect-related subjective states. In engaging with this dual aspect of affect, it is important to be able to distinguish clearly between the two concepts of trait and state. The literature defines personality as "stabilities of behavior and beliefs about our enduring dispositions" (Matthews, Deary, & Whiteman, 2003), while emotional states are transient internal conditions (Eysenck & Eysenck, 1975) that are immediately accessible to the individual. Unlike states, which are directly experienced, traits are propensities for feelings, thoughts or behaviors.

Both emotion-related traits and states potentially play a role in creativity, but more systematic empirical work is needed to elucidate the particular associations with creative performance, and DT in particular. Both strands of research are reflected in a theory developed by Russ (1999) in which general personality characteristics and affect-related states would influence cognitive processes associated with creativity, such as divergent thinking (DT). The present study seeks to build on this theoretical perspective extending it through the integration of emotion-related traits and states as two key sources of individual differences in emotionality. The novelty of this research is that it simultaneously examines effects on creativity of the well-established trait EI construct (Petrides, Furnham, & Mavroveli, 2007a), and a multidimensional subjective stress state involving the psychological domains (Hilgard, 1980) of cognition (e.g., appraisal), affect and volition (Matthews, Joyner, Gilliland, Campbell, Huggins, & Falconer, 1999; Matthews et al., 2002).

As for the affect-related personality traits, research has addressed the issue indirectly using broad personality traits such as the Big Five or Giant Three personality dimensions (see Batey & Furnham, 2006; Kaufman, 2009). Only recently this relationship has been more specifically studied through the novel construct of trait emotional intelligence (trait EI or trait emotional self-efficacy) (e.g., Batastini, 2001; Guastello, Guastello, & Hanson, 2004; Wolfradt, Felfe, & Köster, 2002).

Trait EI is considered the most prevalent model of EI used for research as well as educational and organizational purposes (Day, 2004; Mikolajczak, Menil, & Luminet, 2007b). Trait EI is a personality trait conceptualized as a constellation of affective dispositions. The construct provides a more comprehensive operationalization of the affect-related aspects of personality than general Big Five models (Petrides, 2011; Pérez-González & Sanchez-Ruiz, 2014; Vernon, Villani, Schermer, & Petrides, 2008) and lies wholly outside the taxonomy of human cognitive ability (Carroll, 1993). Trait EI can also be interpreted to some extent as the adult development of the "good temperament"; a collection of affective dispositions that are usually adaptive and can serve to reach social effectiveness and well-being (Pérez-González & Sanchez-Ruiz, 2014).

Despite the scant research on this topic, some studies have been conducted in which trait EI correlated with indices of creative personality, creative production in literature, theater and apparel design (Guastello et al., 2004; Wolfradt et al., 2002). However, findings are inconclusive as regards creativity performance as in DT tasks. One of the few existent research on trait EI and DT showed a positive relationship between the two constructs (Batastini, 2001), while another one failed to demonstrate such relationship (Guastello et al., 2004).

DT has been positively associated with emotional instability (e.g., Batey et al., 2009; Wuthrich & Bates, 2001) and affective disorders (Furnham, Batey, Anand & Manfield, 2008). However, evidence for the link between creativity and low self-control is inconsistent. For example, trait anxiety has shown to correlate negatively with DT (Wadia & Newell, 1963; White, 1968), originality (Dentler & Mackler, 1964), and innovativeness (Ganesan & Subramanian, 1982) while other studies have failed to find any relationship between trait anxiety and DT (Mijares-Colmenares, Masten, & Underwood, 1993; see Sanchez-Ruiz, 2011 for a review). A recent meta-analysis of 59 independent samples (Byron & Khazanchi, 2011) confirmed a modest negative association between trait anxiety and creativity test performance, but also found evidence for a number of moderator influences on the anxiety-creativity relationship. In sum, there is need to bring light into the relationship between creativity and those components of trait EI that relate to negative emotionality. One way to do so is to investigate the role of negative emotion at the state level, and not only at the trait level.