Personality and Individual Differences 74 (2015) 22–28

Contents lists available at ScienceDirect

Personality and Individual Differences

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

Who chokes under pressure? The Big Five personality traits and decision-making under pressure

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ARTICLE INFO

Article history:
Received 26 July 2014
Received in revised form 12 September 2014
Accepted 4 October 2014
Available online 23 October 2014

Keywords:
Personality
Decision-making
Performance pressure

ABSTRACT

The purpose of the present study was to examine whether the Big Five personality factors could predict who thrives or chokes under pressure during decision-making. The effects of the Big Five personality factors on decision-making ability and performance under social (Experiment 1) and combined social and time pressure (Experiment 2) were examined using the Big Five Personality Inventory and a dynamic decision-making task that required participants to learn an optimal strategy. In Experiment 1, a hierarchical multiple regression analysis showed an interaction between neuroticism and pressure condition. Neuroticism negatively predicted performance under social pressure, but did not affect decision-making under low pressure. Additionally, the negative effect of neuroticism under pressure was replicated using a combined social and time pressure manipulation in Experiment 2. These results support distraction theory whereby pressure taxes highly neurotic individuals' cognitive resources, leading to sub-optimal performance. Agreeableness also negatively predicted performance in both experiments.

1. Introduction

'Choking under pressure' refers to the phenomenon whereby people underperform in high stakes situations relative to their level of performance without pressure (e.g., Baumeister, 1984; Beilock & Carr, 2005; Markman, Maddox, & Worthy, 2006). In the context of decision-making, choking under pressure occurs when individuals make effective decisions in low-pressure situations but sub-optimal decisions under pressure. Thus, their decision-making performance decreases as the level of pressure increases. Trait activation theory, which proposes that specific trait-relevant situational cues can be used to predict behavioral responses to those situations, may help explain how specific traits may elicit different behaviors in low- and high-pressure contexts (Tett & Guterman, 2000). Responses depend on both the relevance of a situation to a trait and the strength of the trait evoked. Thus, certain traits are more likely to emerge if a situation strongly evokes them (Lievens, Chasteen, Day, & Christiansen, 2006).

Performance pressure often occurs in high-stakes success or failure situations, and consequently, these situations may activate certain traits, such as anxiety, narcissism, and fear of negative evaluation, that may in turn affect individual performance. For example, anxiety for test-taking or competitions has been shown to lead to decrements in performance in those situations, even though anxious individuals may be highly competent in low-pressure contexts (e.g., Ashcraft & Kirk, 2001; Beilock & Carr, 2005; Martens, Vealey, & Burton, 1995). Fear of negative evaluation has also been shown to increase anxiety and decrease performance under pressure in athletes (Mesagno, Harvey, & Janelle, 2012). Moreover, low levels of narcissism have been associated with poor performance under pressure on both physical and cognitive tasks (Wallace & Baumeister, 2002). While previous research has examined how personality influences performance under pressure, it is less clear how personality would affect performance in the decision-making domain specifically. In the present study, we examine the important question of 'who chokes under pressure' by focusing on how individual differences in personality might affect decision-making under pressure.

The Big Five personality model, comprising the factors of openness, extraversion, agreeableness, conscientiousness, and neuroticism, is the most widely used classification of personality in psychological research (John & Srivastava, 1999). In decision-making domains, the Big Five model has been studied in the context of delay discounting, reward sensitivity, gambling, and risk-taking (e.g., Hirsh, Morisano, & Peterson, 2008; Mecca, 2003; Nicholson, Soane, Fenton-O'Creevy, & Willman, 2005; Ostaszewski, 1996),

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http://dx.doi.org/10.1016/j.paid.2014.10.009
0191-8869/

though little is known regarding how the Big Five personality model plays a role in decision-making under pressure. However, one theoretical approach to examine choking under pressure during decision-making is offered by distraction theory, which proposes that pressure-filled situations distract attention away from the task, leading to poorer performance (Lewis & Linder, 1997). In contrast to explicit monitoring theory which applies in the context of proceduralized skills (Baumeister, 1984), distraction theory is relevant to cognitive processes, such as decision-making (Lewis & Linder, 1997). According to research on distraction theory, pressure generates mental distractions that decrease available working memory (WM) resources that should be allotted to cognitively demanding tasks (Beilock & Carr, 2005; Beilock, Kulp, Holt, & Carr, 2004). In the context of decision-making, individuals who are preoccupied by the pressure component of a decision may be more likely to have reduced cognitive resources available to make an optimal decision.

In regard to the Big Five traits, previous research has established that neuroticism is positively associated with anxiety and that this relationship is mediated by thoughts of rumination and worry (Muris, Roelofs, Rassin, Franken, & Mayer, 2005). Furthermore, anxiety has been shown to create intrusive thoughts that disrupt math problem solving ability by taxing WM resources (Ashcraft & Kirk, 2001). Additional support for the detrimental effect of distraction theory on performance has shown that high-pressure situations also create mental distractions that compete for and diminish WM resources that are allocated to the task in low-pressure situations (Beilock, Kulp, Holt, & Carr, 2004). Therefore, under pressure more neurotic individuals should have higher levels anxiety and pressure-related intrusive thoughts that may occupy WM resources, leading to performance decrements as a result of decreased WM capacity in high-pressure situations compared to low-pressure situations. This theory offers a potential mechanism by which neurotic individuals may fail when they most need to succeed.

Besides neuroticism, little work has related personality with both pressure and decision-making contexts. As a result, there are few inferences we can draw about the relationship between choking under pressure during decision-making and openness, extraversion, or agreeableness. With regard to conscientiousness, previous work with the *N*-back task showed that highly conscientious individuals are more focused on performance tasks, but are less effective at applying skills they learn to other tasks (Studer-Luethi, Jaeggi, Buschkuehl, & Perrig, 2012). As distraction theory suggests, pressure may increase cognitive load and consume that focus and attention, leading to decrements in performance, or 'choking', compared to pressure-free situations. However, based on previous research with performance pressure and distraction theory, neuroticism was predicted to be the most likely trait to affect decision-making behavior under pressure.

In order to assess decision-making performance, we utilize a reflective decision-making task in which the optimal strategy involves foregoing an option with larger immediate rewards on each trial in favor of an option that provides larger delayed rewards. Prior work using this task has shown that performing a concurrent dual WM-demanding task impairs decision-making performance whereby individuals selected the immediately rewarding option more, indicating that the task is WM dependent and that WM distraction could cause performance decrements (Worthy, Otto, & Maddox, 2012). By utilizing this task we can examine whether certain personality characteristics may make individuals more vulnerable to distraction of WM resources when placed under pressure, which would result in preference for the immediately rewarding option, and consequently impaired performance, on the task.

2. Experiment 1

Experiment 1 used a dynamic decision-making task that has been previously used to study individuals' ability to find a decision strategy when the task involved choosing between immediate and long-term benefits of each option (Gureckis & Love, 2009; Worthy, Gorlick, Pacheco, Schnyer, & Maddox, 2011; Worthy et al., 2012). This task is choice history-dependent in that the rewards they receive are dependent on their decisions made on previous trials. We used a social pressure manipulation that has been used extensively in previous work with both between- and within-subjects designs, and has been shown to impair performance in cognitively demanding tasks (Beilock & Carr, 2005; Beilock et al., 2004; DeCaro, Thomas, Albert, & Beilock, 2011; Markman et al., 2006; Worthy, Markman, & Maddox, 2009). It has also been shown to enhance WM distraction (DeCaro et al., 2011), and we predicted that WM distraction would hurt performance on the task given prior work that has found a negative effect of WM load in the same task (Worthy et al., 2012). Participants were instructed that if they reached a certain performance criterion on the task, then both they and a (fictitious) partner would earn a monetary bonus, but if they failed to reach their goal neither would receive the bonus. This manipulation was designed to mirror the effect of common sources of real-word pressure, including monetary incentives, peer pressure, and social evaluation in decision-making contexts.

2.1. Method

2.1.1. Participants

One hundred and twenty-seven (76 female, 51 male) undergraduate students at Texas A&M University participated in the experiment for course credit. Participants were randomly assigned to either the low-pressure ($n = 63$) or high-pressure ($n = 64$) condition.

2.1.2. Measures

2.1.2.1. Big Five Inventory. The 44-item Big Five Inventory (BFI) consisted of statements regarding openness, conscientiousness, extraversion, agreeableness, and neuroticism. Participants were asked to indicate, using a 5-point Likert scale (from strongly disagree to strongly agree), the degree to which each statement described their personality (John, Donahue, & Kentle, 1991). The BFI has been shown to have high internal consistency with Cronbach's alpha ranging from .79 to .88 for each of the five personality traits ($M = .83$), and has strong convergent validity with other Big Five personality scales, including the Neuroticism–Extraversion–Openness Five Factor Inventory (NEO–FFI; $r = .73$) and the Trait Descriptive Adjectives questionnaire (TDA; $r = .81$; John & Srivastava, 1999).

2.1.2.2. Decision-making task. The dynamic decision-making task entailed selecting between immediate and long-term benefits (Gureckis & Love, 2009; Worthy et al., 2011, 2012). In the task, participants repeatedly chose between two options that provide points on each trial in attempt to maximize the number of points gained over the course of the experiment. The *Increasing* option gave a smaller immediate reward on each trial, but caused delayed rewards for both options to increase. In contrast, the *Decreasing* option gave a larger immediate reward, but caused delayed rewards for both options to decrease. Point values increased or decreased by five-point increments for each option. Participants started the task with 55 points if choosing the Increasing option first which increased to a maximum value of 80 points if repeatedly selected. Similarly, participants started the task with 65 points