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Examining cognitive performance: Do perfectionism and rumination matter?

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ABSTRACT

Research has looked to possible personality constructs that can affect cognitive performance. Studies have demonstrated that working memory and attentional effectiveness can be directly related to the cognitive resources upon which one is readily able to call. Whereas limited research has examined the role of perfectionism in relation to problem solving abilities, to date, no studies have specifically examined how it may affect working memory or attention. The study's purpose was to assess the impact of task difficulty (high, medium, or low) and personality constructs on working memory and attention. Following completion of the personality measures, participants completed the d2 test of attention and an N-back task. Results indicated that perfectionism and rumination significantly affected accuracy but not reaction time on the N-back task and that rumination significantly affected the total number of items processed on the d2 test of attention. Given the lack of elevated scores on the personality indicators within this sample, future research might examine this process in those more strongly endorsing these traits, allowing us to better ascertain the degree to which cognitive deficits may be evident.

1. Introduction

On a day-to-day basis, individuals utilize their working memory and their attentional resources for a variety of both complex and simple cognitive tasks (Bayliss, Jarrold, Gunn, & Baddeley, 2003). Studies have looked to individual characteristics that can affect cognitive performance and many have shown that cognitive effectiveness is directly related to the amount of resources upon which one is able to readily call (Hill et al., 2010). Thus, it can be argued that cognitive interference can affect the ability to utilize one's cognitive resources.

Many studies have looked at the variety of personal attributes that might facilitate or impede one's cognitive performance, and some have suggested that constructs, such as perfectionism and rumination, may play a contributing role (Davis & Nolen-Hoeksema, 2000; Stoeber & Eysenck, 2008). More specifically, these may affect one's ability to integrate information into working memory or may limit one's attentional resources as a result of being cognitively preoccupied, narrowing the available cognitive resources and potentially limiting one's ability to perform a task. When considering cognitive performance, it seems pertinent to consider and understand the influence of these individual personality factors. Although previous research has provided some insight into how these personality constructs independently affect cognitive functions (Bayliss et al., 2003; Hill et al., 2010), the current study seeks to add to the literature by being the first to specifically examine their individual influence on working memory and attention.

A model proposed by Hewitt and Flett (1991) suggested that perfectionism contains both a personal and social dimension and that each dimension may contribute to maladaptive functioning within the individual. According to this model, perfectionism can be further broken down into three different domains. Self-oriented perfectionism (SOP) speaks to one's tendency to both set and seek high standards for oneself, whereas in other oriented perfectionism (OOP) one believes that others should seek to be perfect. These domains differ from the third, socially prescribed perfectionism (SPP), where individuals perceive that others expect perfection of them. Although there appears to be a suggestion in the literature that perfectionism may include an adaptive component, SOP and SPP, as conceptualized by Hewitt and Flett (1991), have both been found to be positively associated with several maladaptive outcomes (e.g., Besser, Flett, Hewitt, & Guez, 2008).

Studies (e.g., Stoeber & Eysenck, 2008) have looked at how perfectionism might influence one's ability to complete a cognitive task, and have found that the performance of individuals higher

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in perfectionism is often affected. These authors discovered that when individuals high in perfectionistic standards were given a timed proofreading task, they were less accurate and took more time in their decision-making. As such, individuals who are often preoccupied with attaining a state of perfection, when confronted with a task such as this, may be more focused on their own concerns, resulting in a reduction in cognitive resources (Stoeber & Eysenck, 2008).

While the previous study suggested that overall accuracy is diminished in those higher in perfectionism when they are confronted with a timed performance task, other studies have examined the effects of the absence of a time constraint (Stoeber, Chesterman, & Tarn, 2010). In this study, in the absence of a time pressure when using a letter-detection task it was noted that those higher in perfectionistic strivings had higher task accuracy, but demonstrated delayed reaction times. This would suggest that time constraints, when placed on an individual higher in this particular facet of perfectionism, may interfere with decision making ability by significantly increasing the amount of time it takes to respond, while not necessarily affecting the ability to be accurate (Stoeber et al., 2010).

Although a high degree of accuracy may seem beneficial, research has shown how this tendency can negatively influence performance. As exemplified in a recent study by Sherry, Hewitt, Sherry, Flett, and Graham (2010), university professors who scored higher in trait measures of perfectionism (SPP and SOP) were found to have lower overall productivity (as measured by the total number of publications) as compared to colleagues who scored lower. Sherry et al. (2010) contend that individuals higher in perfectionism are more likely to avoid making decisions that may lead to feelings of rejection, affecting their overall performance.

Given the impact of cognitive preoccupation on task performance, and the underlying ruminative quality that is evidenced in such a process, it is worth examining more closely not only the unique influence perfectionism may have on performance but on rumination as well. In contrast to perfectionism, where thoughts often pertain to the need to be perfect, rumination refers to repeatedly focusing attention on one's own negative emotions and the causes or consequences of said emotions (Davis & Nolen-Hoeksema, 2000). These authors further proposed that excessive emotional rehearsal can in turn impact one's cognitive abilities as one becomes preoccupied with one's own negative affect and, consequently, is unable to focus. Rumination thus acts as an interfering cognitive process, limiting the resources that one is able to allocate to solving a given problem (Ward, Lyubomirsky, Sousa, & Nolen-Hoeksema, 2003).

Studies have shown that individuals higher in ruminative tendencies often have a harder time switching their attention away from their negative emotions onto the task at hand (Davis & Nolen-Hoeksema, 2000). Using the Wisconsin Card Sorting Task, these authors discovered that those who rated higher in ruminative responses also tended to demonstrate an inability to shift cognitive focus, leading to overall decreases in performance. Thus, when faced with a situation in which they must adapt their cognitive strategies, ruminators often become cognitively trapped in a strategy that may have brought them previous success. However, when this strategy no longer brings success, as evidenced by failed attempts, individuals higher in ruminative tendencies are unable to adapt and hence their task performance decreases (Davis & Nolen-Hoeksema, 2000).

The current study therefore seeks to more purposely explore how personality traits such as rumination and perfectionism may influence the ability to call upon one's cognitive resources and to examine the extent to which this may affect performance. Building on previous work by Stoeber and Eysenck (2008) and Stoeber et al. (2010), which suggested that individuals higher in perfectionism are more likely to be cognitively distracted and as such relatively slower when making decisions, and that those higher in perfectionism may be more concerned with being accurate as opposed to being fast when it comes to task performance, it was hypothesized that individuals higher in perfectionism would be accurate but slower. That is, when presented with a cognitive task, individuals higher in perfectionism would be slower in their decision making ability, thereby increasing reaction times without impacting their overall accuracy. It was also anticipated that individuals higher in rumination would be slower and less accurate. Specifically, previous literature has suggested that when ruminators are asked to complete a problem-solving task, their inability to focus on the task at hand interferes with their decision-making ability affecting their ability to respond quickly (Ward et al., 2003). Thus, individuals who ruminate may be focused on excessively replaying their negative emotions and are therefore unable to attend, store and manipulate the information being presented (Blankstein & Lumley, 2008).

2. Method

2.1. Participants

No significant differences were noted across groups on the demographic data collected and as such demographic information will be reported for the entire sample. In total, 94 participants (75 women and 19 men) were included in the study. Of these, only a subset of 62 participants was included in the assessment of working memory using the N-back task. Participants ranged between 17 and 44 years of age, with a mean age of 22.39 (SD = 5.57). The majority (79.8%) of participants were female. The sample consisted primarily of individuals who were in either their first (77%) or second (13.8%) year of post-secondary study.

2.2. Measures

2.2.1. Perfectionism

The Multidimensional Perfectionism Scale (MPS) was used to assess trait perfectionism and contains three subscales; SOP, OOP and SPP (Hewitt & Flett, 1991). The MPS is a 45-item measure and participants are asked to indicate their level of agreement to statements such as "One of my goals is to be perfect in everything I do" on a 7-point scale ranging from strongly disagree to strongly agree, with higher scores indicating a greater amount of intrapersonal and interpersonal perfectionistic tendencies. The MPS has demonstrated high internal consistency on each of the subscales with alpha coefficients ranging from .82 to .87 (Hewitt & Flett, 1991).

2.2.2. Rumination

The Ruminative Responses Scale (RRS) assesses emotional responses that are focused on the self as well as the causes and consequences of said emotional responses (Nolen-Hoeksema & Morrow, 1991). The RRS is a 22-item measure and participants are to indicate the frequency of statements such as "Think about how alone you feel" using a 4-point scale that ranges from almost never to almost always, with higher scores indicating a greater amount of ruminative thoughts. The RRS has demonstrated high internal consistency with an alpha coefficient of .90 (Treynor, Gonzalez, & Nolen-Hoeksema, 2003).

2.2.3. Working memory

Working memory was measured using an N-back task. In this task, participants are shown a sequence of letters and are then asked to decide whether or not the letter that is currently being