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Investigating the nomological network of multitasking ability in a field sample

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ABSTRACT

This study explores the correlates of multitasking ability, as measured by a commercially developed test that has been used for high stakes personnel selection contexts with more traditional predictors (i.e., personality and cognitive ability) in an organizational sample. Multitasking ability exhibited differential relationships with the cognitive and non-cognitive variables. That is, multitasking ability was found to be strongly positively related to cognitive ability, and negatively related to conscientiousness. Based on a multiple regression and relative weights analysis, cognitive ability proved to be the only significant unique predictor of multitasking ability. Results and implications for the use of multitasking ability assessments in a selection context are discussed.

1. Introduction

Multitasking refers to the ability of switching between multiple tasks that require a conscious shift of attention between them over a short time span (Oswald, Hambrick, & Jones, 2007). Indeed, while multitasking has been defined in a variety of ways over time (see Delbridge, 2000; Oswald et al., 2007; Salvucci & Taatgen, 2011), three critical definitional components including shifting cognitive resources between tasks, uncertainty regarding when task switching will be required, and salient time pressures capture its unique properties (Delbridge, 2000). The ability to multitask has been conceptualized both as a trait that is stable across situations (Oswald et al., 2007) and a general aptitude which determines successful completion of multiple tasks (Brookings & Damos, 1991). Research has shown that there are differences in the way individuals react to the pressures of multitasking due to non-cognitive differences (Oswald et al., 2007) as well as cognitively-loaded differences such as cognitive ability, working memory, fluid intelligence, and the ability to prioritize and sequence tasks (e.g., Delbridge, 2000; Hambrick, Oswald, Darowski, Rench, & Brou, 2010; Ishizaka, Marshall, & Conte, 2001; Kinney, 2007; König, Buhner, & Murling, 2005).

Multitasking behavior has been explained by the theory of threaded cognition, which asserts that multitasking behavior is a result of multiple threads of simultaneous cognition where each of the thoughts signifies a different goal of task accomplishment (Salvucci & Taatgen, 2011). Activities can be carried out to the extent that cognitive, perceptual, and motor resources are available. Salvucci and Taatgen (2011) summarize the theory of threaded cognition tenets as follows: multiple tasks can be engaged by concurrent threads of cognition which each represents differing task goals; cognitive resources are allocated to serve one thread at a time; threads consume and release cognitive resources as needed; and when multiple threads compete for cognitive resources, priority is given to the task associated with the highest level of urgency.

Differences in multitasking ability across individuals have been researched for many years (see Brookings & Damos, 1991 for a review of this early research), and evidence in support of cognitive and non-cognitive correlates varies. Oswald et al. (2007) explain that individuals can react very differently in the face of multitasking demands, such that some may perceive the situation as "interesting and exciting", while others may perceive the same situation as "threatening and stressful," (Oswald et al., 2007; p. 82).

Recent research has called for further investigation of the relationships between multitasking ability and non-cognitive variables (Poposki, Oswald, & Chen, 2009). In fact, researchers have argued that when new constructs are proposed for use in organizational assessment, the correlates of the new construct with traditional predictors should be examined (cf. Van Rooy & Viswesvaran, 2004; Landy, 2005; Locke, 2005). In this study, we explore the correlates of multitasking ability with other individual differences (i.e., personality and cognitive ability). Furthermore, we use a commercially developed measure of multitasking ability that has been used for high stakes personnel selection contexts. Very little empirical research has explored how

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measures of multitasking used in the field correlate with cognitive ability and Big Five factors of personality. This paper attempts to address this important question.

The current study differs from the earlier studies in that it employs a real-world multitasking assessment that is used with job applicants in selection contexts. Most prior research studies are conducted with student samples and based on experimental tasks. Hence, assessing the generalizability of existing findings to organizational samples is needed. Secondly, the tasks (i.e., test items) in commercial multitasking assessments are more job-relevant and their correlates with traditional predictors (again assessed in organizational samples) need to be established. The test items used in prior assessments of multitasking are more experimentally based. We have found that high fidelity simulations used in organizational settings are more costly to develop and are much more sophisticated (the term gamification has been used for some of these assessments—Fetzer, 2015; Fetzer & Tuzinski, 2013) than those used in many research studies on simulation validity (Fluckinger, Dudley, & Seeds, 2014). Our study (in contrast to most prior studies) evaluates the pattern of correlations when high fidelity multitasking assessments are employed. To the best of our knowledge, this is the only published empirical study of this nature.

Thus, the present study makes two unique value-added contributions when we report the correlates of multitasking with traditional predictors: (1) the use of an organizational sample and (2) a commercially developed and used assessment of multitasking. These correlations are critical to our science and practice as they help us establish the incremental validity of multitasking as a predictor. The correlations are needed to assess how group differences, adverse impact, etc., will be affected if multitasking is added to our selection assessment battery. Further, theories of job performance that incorporate this construct of multitasking with other predictors will need estimates of these bivariate relationships. To test these theories, meta-analyzed correlations between the predictors have been compiled and this matrix of meta-analyzed correlations (Viswesvaran & Ones, 1995) has been subject to path analyses. Thus, establishing correlations between important predictors (e.g., multitasking with cognitive ability, personality) is an important undertaking. Our study is perhaps the first to assess these correlations with an organizational sample and a commercially developed simulation to assess multitasking.

1.1. Non-cognitive individual differences and multitasking

Researchers have called for further investigation into the relationships between multitasking ability and personality (Poposki et al., 2009). The limited research investigating the relationships between multitasking ability and personality suggests that there are differences in the way individuals react to the pressures of multitasking (e.g., Delbridge, 2000; Kinney, 2007; Oswald et al., 2007; Stachowski, 2011). In the present study, the relationships between multitasking ability and three factors from the Big Five conceptualization of personality (specifically emotional stability, conscientiousness, and openness to experience) will be tested in an organizational sample. Several meta-analytic cumulations (e.g., Barrick & Mount, 1991) of the Big Five factors predicting organizational outcomes have found conscientiousness to be an important personality factor for explaining individual behavior. Salgado (1997) reported that in addition to conscientiousness, emotional stability is an important antecedent to individual behavior. Finally, openness to experience has been related to training performance and acquisition of new knowledge. Multitasking is to some extent efficient information processing. Given these considerations, we focus on these three factors of the Big Five.

1.1.1. Emotional stability

Neuroticism (the inverse of emotional stability) is characterized by anxiety, worry, and insecurity (Barrick & Mount, 1991). Not only is neuroticism a negative predictor of job performance across a variety of occupations (Barrick, Mount, & Judge, 2001), neuroticism has also been found to be negatively related to multitasking performance (Oswald et al., 2007; Poposki et al., 2009; Szymura & Necka, 1998). Research by Kinney, Kung, Delgado, and Meckley (2010) suggests that individuals high in stress tolerance are better able to handle the time urgency associated with a multitasking environment. Highly neurotic individuals are more likely to experience more stress and anxiety that hinders performance in an environment requiring a focus on multiple tasks simultaneously, the need for frequent switching of attention, and the presence of time pressures (Oswald et al., 2007).

Later research identified differences in anxiety levels elicited by multitasking simulations as a possible reason for this difference, as anxiety partially mediates the relationship between neuroticism and multitasking ability (Poposki et al., 2009). More specifically, Oswald and colleagues tested multitasking performance in both "routine" and simulated "emergency" settings. They provide evidence that individuals high in neuroticism perform more poorly than individuals low in neuroticism in the routine setting, but not in the simulated emergency setting. The reasoning for this finding is that anxiety is provoked for everyone in the emergency setting, but only for those individuals high in neuroticism in the routine setting, with anxiety identified as the hindrance of multitasking performance (Oswald et al., 2007). These findings highlight the necessity to remain calm in stressful situations in order to successfully multitask. Consistent with these findings, we predict that emotional stability (the inverse of neuroticism), characterized by the ability to maintain composure, exhibit optimism and confidence in one's abilities, and demonstrate independence will be related to performance on a measure of multitasking ability.

Hypothesis 1. Multitasking ability will be positively related to emotional stability.

1.1.2. Conscientiousness

Conscientiousness is characterized by reliability, striving for achievement, thorough concern for detail, organization, and dutifulness (Barrick & Mount, 1991). Conscientiousness is a strong and consistent predictor of performance across a variety of jobs (Barrick et al., 2001). A conscientious individual is likely to have difficulty switching tasks without adequate time to ensure a thorough and detail-oriented approach to task completion. Given the time limits inherent in the definition of multitasking, having a tendency for thoroughness is likely to be an impeding performance factor.

Indeed, conscientiousness has been found to be negatively related to multitasking performance such that individuals high in conscientiousness performed less effectively in simulated emergency environments due to their careful and methodical nature, where emergency situations require swift and automatic responding (Oswald et al., 2007). Accordingly, when emergency type multitasking is a key component of job responsibilities, conscientious individuals may perform less effectively. Due to the nature of the multitasking performance which involves task switching, uncertainty, and time pressures we expect that highly conscientious individuals (characterized by thoroughness, achievement, reliability, and sense of duty) will multitask less effectively.

Hypothesis 2. Multitasking ability will be negatively related to conscientiousness.

1.1.3. Openness to experience

Openness to experience is characterized as being creative, inquisitive, intelligent, and cultured (Barrick & Mount, 1991). It may be intuitive to think, as hypothesized by Delbridge (2000), that individuals high in levels of openness to experience will be more malleable to the demands of a multitasking environment and fare more favorably in an environment requiring frequent change. However, empirical findings