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The effect of regulatory focus on attention residue and performance during interruptions

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ABSTRACT

This paper explores how regulatory focus affects transitions between tasks following interruptions. Consistent with the research on attention residue (Leroy, 2009), we argue that in order to be cognitively available and perform well on an interrupting task, people must cognitively disengage from the task that is interrupted—that is they must fully switch their attention to the interrupting demand. Integrating the research on regulatory focus (Higgins, 1997) and attention residue (Leroy, 2009), we predict that both the framing of the initial/interrupted task and the framing of the interrupting task interact to affect how well people switch their attention to and perform on an interrupting task. This investigation allows the identification of when attention residue is most likely to occur, hindering performance on the interrupting task and how attention residue can be prevented or mitigated. Data across three studies support our predictions.

1. Introduction

As jobs become increasingly complex and multifaceted, workers are interrupted with greater frequency throughout the course of task performance. Although interruptions may contribute to individual and organizational responsiveness and a faster work pace, understanding the performance effects of such a work phenomenon has become a necessity. Research on interruptions has documented the deleterious effects in regard to the initial, interrupt*ed*, task; interrupted tasks are frequently not resumed in a timely manner, if at all (O'Connail & Frohlich, 1995), and even when/if eventually resumed, their performance is typically characterized by slow resumption and underperformance as one gets back up to speed (Altmann & Trafton, 2007; Speier, Valacich, & Vessey, 1999; Speier, Vessey, & Valacich, 2003).

Much less is known about how the interruption scenario impacts performance on the interrupt*ing* task. Interruptions necessitate shifts in attention from one task to another before the first is finished. However, recent research indicates that individuals often find it difficult to fully extinguish thoughts about an initial, unfinished task (Task A), even after beginning work on another (Task B), a phenomenon labeled "attention residue" (Leroy, 2009). Attention residue leaves fewer resources available for Task B, thus impairing its performance (Leroy, 2009). Given the relevance and importance of interrupting tasks for organizations' performance, it is critical to understand what factors influence attention residue in the context of interruptions. Unfortunately, little work has explored what contributes to attention residue when people are interrupted in their work, nor what might be done to prevent it.

In the present research, we examine the impact of Regulatory Focus on attention residue and performance while dealing with an interruption. Regulatory focus theory (Higgins, 1997) posits two motivational orientations influencing the self-regulation of goal-directed behaviors: a promotion focus that emphasizes approaching one's ideals, and a prevention focus that is driven by the desire to avoid falling short of one's duties or obligations. We propose that regulatory focus has important implications for attention residue in the context of interruptions. However, the nature of this influence is likely to depend on the regulatory focus of *both* the initial interrupted task *and* the subsequent interrupting task. That is, although the regulatory focus framing of Task A may influence individuals' receptivity to a shift in attention away from Task A towards Task B—with corresponding impacts on Task B performance—this effect may be accentuated or attenuated depending upon the regulatory focus framing of the interrupting task.

By simultaneously examining Task A regulatory focus and Task B regulatory focus, the present studies provide a look into the complex interplay of Task A and Task B characteristics and their

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influence on attention residue and performance in the context of interruptions. In doing so, our investigation provides important inferences into the nature of the phenomenon. Further, by integrating the theories on attention residue (Leroy, 2009) and regulatory focus (Higgins, 1997), this manuscript advances knowledge about attention regulation in the context of interruptions, contributing to new understanding of the effects of interruptions on interrupting tasks. It also contributes to theory on attention residue by uncovering new insights not only about contributing factors but also how to prevent it – an area that has received little attention in the existing literature. Additionally, the present manuscript reveals that regulatory focus is especially relevant to the study of attention regulation and more specifically attention transition—a focus that had received only very limited consideration.

2. Attention regulation in the context of interruptions

Research on interruptions has largely focused on the consequences for the interrupted task, highlighting the resulting resumption and performance costs once the initial task is resumed (Altmann & Trafton, 2007; Speier et al., 1999, 2003). Much less is known about the factors that affect people's ability to put the initial task aside—that is, to end any related cognitions—and be cognitively available to perform an intervening/interrupting task. This oversight may be due to the fact that interruptions are initiated specifically to benefit the interrupting task, which is often addressed without delay. It may also be due to limitations of existing theories on attention regulation. For example, attempts to extend the literature on goal activation and inhibition (Johnson, Chang, & Lord, 2006; Lord & Levy, 1994; Shah & Kruglanski, 2002) to predict attention and performance on interrupting tasks lead to limited, and often contradictory predictions.

Research on goal activation and inhibition indicates that when a goal is active, competing goals are actively inhibited, dropping below their baseline level of accessibility. This process, sometimes referred to as goal shielding (e.g., Shah, Friedman, & Kruglanski, 2002), protects against attention being diverted away from one's current concern to other potential alternatives. Direct application of the goal shielding concept to the interruption context suggests that cognitions related to the initial task should be inhibited upon shifting to the interrupting task, allowing the interrupting task to be performed unencumbered. However, given the considerable variability in the extent to which goal shielding occurs in any given situation (e.g., Leander, Shah, & Chartrand, 2011; Plessow, Fischer, Kirschbaum, & Goschke, 2011; Shah et al., 2002), this conclusion appears premature and may be unwarranted. Therefore, more work is needed to understand the challenges and implications of interruptions, as the current literature provides limited insights into attention regulation in the context of interruptions.

The research on attention residue provides valuable insights relevant to the study of interruptions. The interruption scenario is one in which inhibition of alternatives may be particularly likely to fail, resulting in attention residue. Attention residue occurs when thoughts about one task persist and intrude while performing another (Leroy, 2009). Existing goal shielding research has largely focused on how goals that could be pursued in the present compete with each other, but has not considered how goals that have been pursued in the recent past may also be competing against goals to purse in the present. The attention residue theory addresses this gap by investigating how goals from the immediate past can be difficult to inhibit, even after people have switched to working on another task (Leroy, 2009). Goals from the immediate past tend to be highly active, more so than goals that have not yet been pursued, thus requiring greater levels of inhibition to prevent interference with currently focal goals. Thus, they are susceptible to maintaining their activation in the face of inhibitory processes. With interruptions, the inhibitory challenges resulting from recency are exacerbated by their state of incompleteness. Psychologists have long recognized the potential for greater cognitive accessibility of incomplete goals (Klinger, 1975; Lewin, 1926), which explains, for example, why individuals have greater memory for uncompleted rather than completed tasks (e.g., Zeigarnik, 1927). Therefore, because interrupted goals are from an immediate past and must be put aside while still incomplete, they present a particular challenge for the inhibitory processes that are necessary to avoid interference with the interrupting task, creating strong potential for attention residue even after ostensibly shifting focus to the interrupting task.

Conditions that give rise to attention residue may also have important implications for performance. Given people's limited cognitive resources (Kahneman, 1973; Norman & Bobrow, 1975; Pashler, 1994), the experience of attention residue reduces the availability of cognitive resources for performance (Leroy, 2009). Performance suffers when people are under cognitive load or only invest part of their cognitive resources (Beal, Weiss, Barros, & MacDermid, 2005; Kahn, 1992; Kanfer & Ackerman, 1989), especially if the task at hand requires substantial cognitive resources. As a result, under conditions where attention residue occurs, task performance tends to also suffer (Leroy, 2009).

Thus, it is important to identify factors likely to contribute to or, by contrast, help prevent attention residue in the context of interruptions. Prior research on attention residue has focused on the influence of the conditions under which people anticipate resuming the interrupted task. Leroy (2011) found greater attention residue and lower performance on an intervening task when performers anticipate resuming the interrupted task under time pressure. Although these findings are insightful, there is both theoretical and practical need to further develop our understanding of attention residue to identify other important factors that are likely to accentuate or attenuate its occurrence in the context of interruptions. In the current study, we examine the impact of characteristics of both the initial and the interrupting tasks on attention residue and performance. Specifically, we integrate research on regulatory focus and attention residue to advance current understanding of what can affect attention residue and performance on an interrupting task.

3. Regulatory focus

Regulatory focus theory (Higgins, 1997) provides an important lens through which to understand the regulation of cognition, motivation, and behaviors during goal pursuit. It differentiates between two self-regulatory systems. A promotion focus represents goals as opportunities and aspirations that are attained through advancement, aspiration, and accomplishment. By contrast, a prevention focus represents goals as obligations and responsibilities that are met through vigilant and safe behaviors. Although regulatory focus can be construed as an individual difference (Higgins, 1996), it can be temporarily activated by the context, and easily so, as for example, through one's goal or task framing (Higgins, 1997).

Regulatory focus has been shown to affect many processes. At a cognitive level, it focuses attention on information that is compatible with one's regulatory focus (Higgins, Roney, Crowe, & Hymes, 1994). At a motivational and behavioral level, it influences the performance strategies people use to reach their goals (e.g. Lanaj, Chang, & Johnson, 2012). For example, under a promotion focus, people are motivated to approach desirable end-states and will engage in activities or behaviors that are consistent with their goals. By contrast, under a prevention focus, people are motivated to avoid undesirable end-states and will restrain from engaging in activities that are inconsistent with their goals. In the work