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Why Is It so Hard to Do My Work?

The Challenge of Attention Residue when Switching Between Work Tasks

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Comments welcome

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Abstract

In many jobs, employees must manage multiple projects or tasks at the same time. A typical workday often entails switching between several work activities, including tasks, meetings, etc. This paper explores how such work design affects individual performance by focusing on the challenge of switching attention from one task to another. As revealed by two experiments, people need to stop thinking about one task in order to fully transition their attention and perform well on another. Yet, results indicate that people find it difficult to transition their attention away from an unfinished task and their subsequent task performance suffers. Being able to finish one task before switching to another is, however, not enough to enable effective task transitions. Time pressure while finishing a prior task is needed to disengage from the first task and thus move to the next task and it contributes to higher performance on the next task.

Key words: task transitions, attention, time, task performance.

"The only factor becoming scarce in a world of abundance is human attention"

- Kevin Kelly *in* '*Wired*'

In today's organizations, the time available for performance has become highly fragmented (Mark, Gonzalez, & Harris, 2005; Perlow, 1999; Tetard, 1999, 2000). People rarely have the opportunity to work on one task for an unlimited amount of time. Meetings, deadlines, unexpected events requiring immediate action, or interruptions often force employees to frequently switch between tasks, dictating what they must pay attention to at a given moment and limiting their time on a given activity (Czerwinski, Horvitz, & Wilhite, 2004; Jett & George, 2003; Perlow, 1999). At the same time, organizations encourage people to work on multiple projects concurrently in order to maximize productivity and to increase flexibility and responsiveness to constantly changing markets (DiMaggio, 2001; Espinosa, Cummings, Pearce, & Wilson, 2002; Gonzalez & Mark, 2004). But can people be effective and perform at their full potential when their time is fragmented and they must frequently switch between tasks?

Several field studies have documented the fragmented nature of time at work and how the resulting work dynamics can be stressful for employees (e.g. Gonzalez & Mark, 2004; Perlow, 1999; Zijlstra et al., 1999). While interruptions have some beneficial properties, existing research shows that they largely hurt productivity (Jett & George, 2003; Speier, Valacich, & Vessey, 1999; Tetard, 1999), as people find it difficult to get back into the flow of the interrupted activity. While past research has focused on the implications of interruptions for performance on the original interrupted task, little research has explored the effects on subsequent task performance. Yet, having to put one's work aside to attend to another task is likely to affect how people engage in subsequent tasks.

People who transition between tasks must switch their focus of attention from one task to the next. The self-regulation research argues, however, that disengaging from a task is often difficult (Baumeister, Heatherton, & Tice, 1994; Muraven & Baumeister, 2000; Wrosch, Scheier, Miller, Schulz, & Carver, 2003), suggesting that transitioning attention from one task to another is effortful. In addition, other research shows that performance suffers when people are distracted by unrelated thoughts (Beal at al., 2005; Kahn, 1990, Kahn, 1992). The present research explores the process of attention regulation across sequential tasks to understand what factors may either hinder or facilitate the transition of attention from one task to another and how these factors affect subsequent task performance.

This paper begins with the proposition that whether a person fully transitions his or her attention from one task to another depends upon two fundamental motivations that can be triggered on the first task: the need for completion (Lewin, 1926, 1935) and the need for cognitive closure (Kruglanski, 1989, 1990; Kruglanski & Webster, 1996). Both of these needs have been argued to affect attention regulation (e.g. Rothermund, 2003; Kruglanski, 1990).

The need for completion, which everyone experiences when pursuing a goal or working on a task, represents the need to attain a task goal (Lewin, 1926, 1935). The need for cognitive closure is defined as a fundamental need for an answer, any answer as opposed to confusion or ambiguity on a given problem (Kruglanski, 1990). Both of these needs – the needs for completion and cognitive closure – motivate people to reach an end point. Completion, however, represents the end of necessary goal-oriented behaviors through goal attainment, while cognitive closure represents the end of cognitive processing through the psychological experience of closure or resolve. Since these needs operate at different levels (behavioral and cognitive, respectively), they are not necessarily met concurrently. That is, it is possible for people to

experience closure but not completion (e.g. knowing in one's mind how to solve a mathematical problem without having written down the solution) and completion but not closure (e.g. having written down the solution to the problem but still wondering whether a more elegant solution exists). In this paper, two experimental studies are presented that explore how the needs for completion and cognitive closure, when triggered on one task, affect how people switch their attention to and perform on a subsequent task.

Switching Tasks and Switching Attention

Traditional research in psychology has shown that people have limited cognitive resources (Kahneman, 1973; Norman & Bobrow, 1975; Pashler, 1994). When people are distracted by unrelated thoughts, they have fewer cognitive resources available for their current activity and thus process information less carefully and systematically (Dijker & Koomen, 1996; Gilbert, Pelham, & Krull, 1988; Gilbert & Hixon, 1991). Undivided attention makes people more cognitively vigilant and intellectually alert and is associated with increased cognitive effort (Kahn, 1990; 1992). Furthermore, task performance suffers when people try to process information pertaining to several tasks at once or when they are distracted by external stimuli (Schneider & Fisk, 1982).

Studying the cognitive implications of having to transition between tasks is then central to understanding how task transitions affect people's subsequent task performance. Because people have limited cognitive resources, they must fully transition their attention from one task to another in order to maximize the cognitive resources available for the subsequent task. Traditional research on task engagement and task performance has not considered how the way people engage in and perform on a current task may be affected by whether or not they have disengaged from a prior task. Rather, it focuses on factors that are intrinsic to, or temporally

aligned with one task and its environment (e.g. Job Characteristic Model, Hackman & Oldham, 1976; (Brehm, 1966; Hackman & Oldham, 1976). Similarly, the task switching literature in psychology focuses on a person's cognitive flexibility, or lack thereof, when performing multiple tasks simultaneously[1] (Rubinstein, Meyer, & Evans, 2001), but does not study the ability to cognitively disengage from one task in order to fully concentrate on another.

The following section introduces the concept of attention residue to reflect the difficulty that people experience in switching their attention when switching tasks. Next, the paper turns to the development of hypotheses, focusing on the cognitive and behavioral implications of having to transition from a prior task to a subsequent task. Three main dependent variables are studied: a) goal disengagement from the prior task, b) attention residue, and c) task performance on the subsequent task. Goal disengagement occurs when people end their effort toward a goal and relinquish their commitment or motivation to pursue that goal (e.g. Wrosch & Sheier, 2003). Attention residue occurs when people's attention is still focused on a prior task instead of being fully focused on their current task. The first set of hypotheses relates to the need for completion and examines how finishing a task as opposed to not finishing a task affects disengagement from the goal of the first task, attention residue, and subsequent task performance. The second set of hypotheses relates to the need for cognitive closure and explores its effect on disengagement from the goal of the first task, attention residue, and subsequent task performance when people have reached completion on the first task.

Attention Residue

Ruminative thoughts correspond to a class of thoughts that are triggered and recur even when they are not relevant to the situation at hand and are not required by the immediate environment (Martin & Tesser, 1986). This construct has evolved to integrate a large range of

[1] For example, talking on the phone while driving or writing a presentation while talking on the phone with a client.

cognitive activities, such as counterfactuals, regrets, reminiscing, etc. (e.g. Martin & Tesser, 1996). Within this broad category, I define attention residue as a type of ruminative thought that is specific to the context of task transitioning and the issue of allocating attention among activities; specifically, it describes thoughts that relate to a prior task when working on a subsequent task.

Attention residue represents the extent to which a person's attention is only partially focused on a current activity (task or social interaction) because a prior activity is still holding part of his or her attention. More precisely, that prior activity has stayed active in working memory - up through the present - and keeps attracting attention even though one has had to engage in another activity. Whereas some types of ruminative thoughts can be anchored in events that are far in the past and tend to come and go, attention residue is rooted in temporally proximal events (i.e. a task or social interaction that has recently occurred) that have stayed active and persisted in working memory. To summarize, attention residue occurs when one has switched activities without fully transitioning one's attention.

Attention is highly driven by motivation. Task or situational cues are often not enough to focus thoughts and attention (Lewin, 1926, 1935; Locke, 2000; Pashler, 1998; Rothermund, 2003; Rothermund, Wentura, & Bak, 2001). As a result, the extent to which people experience attention residue when switching between tasks is likely to depend upon the motivational pull associated with the first task. In the next section, I argue that when people's fundamental needs for completion and cognitive closure are not met on a prior task, people will find it more difficult to disengage from the goal of the first task and switch their attention to the next task – that is, they will experience attention residue. Given that only part of their cognitive resources will then be devoted to the next task, their subsequent task performance will suffer.

Need for Completion

In the workplace, the timing of transitions between tasks is often dictated by external constraints (e.g. schedules, deadlines, crises on another project, etc.). As a result, people must often put aside unfinished work in order to attend to their next task (e.g. Perlow, 1999). Lewin (1926; 1935) originally argued that everyone has a need for completion: once a person begins work on a task, he or she has a need to finish it (i.e. reach the task goal). The need for completion motivates people to keep working on a task that is not finished, persist despite difficulties, and resume work that has been interrupted (Lewin, 1926; 1935; Klinger, 1975; Martin & Tesser, 1989; 1996; Ovsiankina, 1928).

When one's need for completion is frustrated, two related dynamics emerge, one motivational and one cognitive. On a motivational level, people who have to permanently stop working on an unfinished task continue to experience the motivation to complete that task (Carver & Sheier, 1998; Lewin, 1926, 1935; Martin & Tesser, 1996). On a cognitive level, goals that are unmet tend to attract attention and stay active in people's minds (Moskowitz, 2002; Rothermund, 2003), even in the absence of relevant external cues (e.g. Klinger, 1975; Wincklund & Gollwitzer, 1982). Because these thoughts are automatic and unintentional, they are difficult to prevent (Martin & Tesser, 1996; Moskowitz, 2002) and to suppress, as the suppression process heightens their accessibility (Wegner, Schneirder, Carter, & White, 1987).

The motivational and cognitive dynamics associated with an unmet need for completion are likely to affect how people transition from an unfinished task to a subsequent task. First, switching tasks will not terminate the motivation to reach completion on the prior unfinished task. Instead, it is likely to prevent a disengagement from the goal of the first task and conflict with, and thus weaken, one's desire to move on to another task.

Second, the desire to focus on the next (now current) task will often not exert enough of an attentional pull for people to fully overcome the conflicting motivational pull associated with completing the prior unfinished task. Switching rooms or files as people switch tasks will have little effect on people's ability to switch their attention, as motivation often overrides the effects of situational cues on attention allocation. The prior unfinished task is then likely to stay cognitively active and attract attention, even as a person moves to the next task. As a result, when people must switch from an unfinished task to another task, they are likely to experience attention residue thereby reducing the amount of cognitive resources available for the next task. Their subsequent task performance is then likely to suffer as well.

By contrast, finishing a task terminates the motivation to keep working on that task: one's need for completion is satisfied (Lewin, 1929, 1935) and the motivational pull of that task is diminished. As a result, once a task is finished, people can more easily switch their attention to a subsequent task without the desire to stay engaged in the prior task. Consequently, switching away from an *unfinished* as opposed to *finished* task is likely to be more difficult, and induce more attention residue and lead to lower performance once people switch to the next task. Hence,

Hypotheses 1-4: When compared to people who have finished a first task before switching to a next task, people who have not finished a first task before switching to another will be less motivated to switch tasks (H1), remain more engaged in the goal of the first task (H2), exhibit more attention residue after the switch (H3), and reach lower performance on the next task (H4).

Need for Cognitive Closure

Task completion terminates the need for goal-directed behaviors, since the task goal has been achieved. Cognitive closure, on the other hand, represents the decision (conscious or

unconscious) to end a cognitive/deliberative process. Kruglanski (2004, 1989) argues that people stop thinking about a task only when they are motivated to put an end to their deliberations, that is, when they reach cognitive closure. Task completion ends the behavioral need to keep working toward the completed task goal and causes people to disengage from that task goal; but it does not necessarily motivate people to stop thinking about the completed task. Indeed, people can keep thinking about a task even after it is finished (e.g. Kruglanski, 2004, 1989). In other words, even though task completion is likely to lead to goal disengagement, it does not necessarily lead to cognitive closure. To fully stop thinking about a task, people have to complete the task and reach cognitive closure. As a result, task completion may not always prevent attention residue from occurring when people switch tasks.

When people want to reach cognitive closure, they are motivated to quickly find an answer or solution to a given situation so that they can terminate their deliberations and stop processing information. Once they have a solution, people who desire cognitive closure freeze on their position, stop processing information, and ignore any new or alternative ideas (Kruglanski & Webster, 1996). They also become very confident in their own judgments and past actions (Kruglanski & Webster, 1996), which further motivates them to stop thinking about the situation. By contrast, people who are not motivated to get cognitive closure tend to keep thinking about a situation even after an answer has been found. They feel less confident in their solutions or decisions (Kruglanski & Webster, 1996), stay open to new information or alternative ideas (Kruglanski & Webster, 1996), and keep exploring competing hypotheses (Mayseless & Kruglanski, 1987, study 3). As a result, compared to people who are motivated to reach cognitive closure, people who are *not* motivated to reach cognitive closure are more likely to keep thinking about a task even after it has been finished.

Previous research has found that the need for cognitive closure is heightened under time pressure (Heaton & Kruglanski, 1991; Kruglanski & Freund, 1983), mental fatigue (Webster, Richter, & Kruglanski, 1996) or environmental noise (Kruglanski & Webster, 1991). Here, I focus on how finishing a task under time pressure affects cognitive closure and the way people transition to a subsequent task. Specifically, by heightening the motivation to reach cognitive closure, time pressure causes people to be more confident in having completed the first task and to reach cognitive closure as soon as task/goal-related behaviors are finished. In turn, cognitive closure contributes to fully terminating the attentional pull of the first task, and thus facilitates the process of switching attention to a different task. By contrast, people who finish a task under low (as opposed to high) time pressure will be less motivated to reach cognitive closure on that task, even after goal-related behaviors are finished. They are therefore more likely to stay cognitively open to and keep thinking about the task. As a result, compared to people who finish a task under *high* time pressure, people who finish a task under *low* time pressure are likely to exhibit more attention residue and consequently exhibit lower performance on a subsequent task. Hence,

Hypotheses 5-7: Compared to people who finish a first task under high time pressure, people who finish a first task under low time pressure will be less confident in having reached the task goal (H5), will exhibit more attention residue after switching to a subsequent task (H6), and reach lower performance levels on the next task (H7).

By contrast, time pressure experienced on an unfinished (as opposed to finished) task is not likely to affect attention residue in the same way. Not having reached the goal on a first task deprives people of the means (i.e. a solution, decision, answer) to reach cognitive closure on that task. Consequently, having to leave a task incomplete after working under high, as opposed to

low, time pressure will not have an additional effect on attention residue and subsequent task performance. Attention residue is already high. Hence, no effect is predicted for high versus low time pressure when the first task is unfinished.

Two experimental studies were designed to test hypotheses 1 to 7 and are presented in the following sections. In both studies, participants were told that they would work on a first task (Task A) and then would perform a second task (Task B). Study 1 measured the effects of two levels of task completion (finished/unfinished) and two levels of time pressure on a first task (high/low) on (a) participants' motivation to switch tasks (Hypothesis 1); (b) participants' subsequent task performance (Hypotheses 4 and 7); and (c) participants' confidence in having completed the first task (Hypothesis 5). Study 2 then measured the effects of completion (finished/unfinished) and time pressure (high/low) on disengagement from the goal of the first task (Hypothesis 2) and attention residue (Hypotheses 3 and 6). In Study 1, both Task A and Task B were performed. In Study 2, participants worked on Task A and were then introduced to Task B. But instead of performing Task B, participants performed a reaction time task designed to measure attention residue.

Study 1

Participants and Design

Seventy-eight undergraduate students (30 men; 48 women) from an Eastern university were randomly assigned to a 2 (task completion: finished/unfinished) x 2 (time pressure: high/low) factorial between-participants design. Participants received $10 for their participation and the experiment was conducted in individual sessions of approximately 40 minutes each.

Procedure and Materials

Upon arrival at the laboratory, participants were told that they would participate in two unrelated studies that were designed by two different researchers. The first study [Task A] focused on intelligence while the second study [Task B] focused on understanding what people value in others. Once the consent form was signed, participants were asked to answer some demographic questions and complete some individual difference measures. Following the questionnaire, participants were asked to work on Task A for five minutes, after which they had to answer three manipulation check questions and report, on a 7-point Likert scale, their confidence in having completed the goal of Task A. Next, participants were asked to work on Task B. After task B, participants had to answer a final questionnaire, measuring their motivation to switch tasks, the time pressure experienced on Task B and their commitment to Task B. The completion and time pressure manipulations were introduced in the instructions for Task A and the completion manipulation was reinforced at the end of Task A.

Task A. Task A was a word task, asking participants to solve 17 clues in a fixed number of one-word answers. Participants were told that completion of the task had been shown to correlate with intelligence. This framing has been commonly used to make participants more motivated to finish a task (e.g. Martin & Tesser, 1996). Participants were given five minutes to work on Task A. Pre-tests were conducted to verify that the experimental story presenting Task A, as related to intelligence, did not affect participants' self-efficacy. It was found that task incompletion did not lower participants' subsequent self-efficacy[2]. (See Appendix A for the materials used for Task A).

[2] 30 participants were randomly assigned to one of the two finished-task/unfinished-task conditions under high time pressure. After working on Task A, participants were asked to answer two questions tapping into their self-efficacy beliefs in relation to Task B: 1) "How capable do you think you are to carry out the next task?" and 2) "How confident are you that you will perform well on the next task?." Given their low inter-item correlation (.12), these

Task B. Task B was presented as a study of how people evaluate job candidates. Participants were given five minutes to review four resumes. (See Appendix B for the materials used for Task B). They were told that after the five minutes, they would be given a job description and would be asked to indicate which candidate they preferred for the position. After the allotted five minutes, the experimenter took the resumes back and asked the participants to perform a surprise recall of the resumes. The surprise recall was presented as an important step that would help participants select the best candidate for the job position. To do this, participants were provided blank resumes and were encouraged to write down any ideas that they could remember about each resume. Borrowing from Kelly and Karau's (1999) instructions for a recall test, participants were asked to stop only when they could not remember anything else from the resumes. Participants were given as much time as they wanted on the recall test. Upon completion of the recall test, participants were given the job description and performed the evaluation of the candidates. After Task B, participants were asked to answer the final questionnaire.

Participants were then debriefed. The debriefing indicated that none of the participants realized the true nature of the experiment. In addition, they were not aware of the relationship between the tasks and did not guess the task completion/incompletion manipulation.

Manipulations

Completion manipulations. Completion on Task A was manipulated by influencing whether or not participants could finish Task A. When Task A was introduced, participants were randomly assigned to one of two types of task instructions, which manipulated their ability to

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two questions were analyzed separately. A *t*-test on the first question revealed that participants in the finished-task condition reported a marginally lower level of self-efficacy (M=4.01, SD=1.14) than did participants in the unfinished-task condition (M=4.75, SD=0.93), $F(1,28)=3.22$, $p=.08$. A *t*-test analysis on the second question revealed no significant main effect of completion, $p>.83$. The two self-efficacy questions were taken out in the Study 1 so as not to artificially increase participants' focus on the performance goal of Task B.

finish Task A. Participants assigned to the finished-task condition were told that Task A would be completed only if they could solve all 17 clues in no more than 13 unique words. Based on pre-testing, this allowed everyone to finish the task within five minutes without making the task too easy or boring. Participants assigned to the unfinished-task condition were told that Task A would be completed only if they could solve all 17 clues in no more than 5 words. Note that the task was not solvable using only 5 words. All participants were given five minutes to work on Task A.

Because of the design of the task, everyone handled the same amount of information and solved the task in 11 to13 words in five minutes, regardless of the completion condition. Only the meaning of participants' performance varied across conditions (i.e. 13 words or less represented a finished task in the finished-task condition whereas it represented an unfinished task in the unfinished-task condition). After the allotted five minutes, the experimenter asked the participants whether they completed the task, checked their performance and wrote on the participants' paper: "task complete" or "task incomplete" depending upon their condition, which matched with their actual performance.

Time pressure manipulations. Following the recommendation of DeDreu (2003) and Karau and Kelly (1992), time pressure was manipulated based on perceptions of time pressure as opposed to the actual time available. Participants' perceptions of time pressure were primed prior to engagement in Task A by eliciting expectations of having either too little or, on the contrary, adequate time for completion. When Task A was introduced, participants were randomly assigned to one of two types of instructions, which manipulated their perception of time pressure. Even though all participants had five minutes to work on Task A, they were told either that "when this test was originally administered at other universities, participants" (a) "reported that

five minutes was not a lot of time to complete the task and that they had to work fast. So try to work as fast as you can" [high time pressure condition] or (b) "reported that five minutes was enough time to complete the task and that they had worked at their own pace. So work at your own pace" [low time pressure condition]. To reinforce the high time pressure manipulation, time was made salient in all high time pressure conditions by using a tape recorder that counted down the minutes in the background. No tape recorder was used in the low time pressure conditions.

Measures

Manipulation checks. Three manipulation check questions were asked right after Task A and before Task B. To test the effectiveness of the completion manipulations, participants were asked (a) whether or not they completed Task A and (b) to what extent they were satisfied with their performance on Task A (7-point Likert scale). Responses to these two manipulation check questions indicated that the completion manipulation was effective. First, participants' answers to whether or not they completed Task A were consistent with the experimental conditions and their actual performance. Second, participants in the unfinished-task conditions reported that they were less satisfied with their performance on Task A (M=2.97; SD=1.62) than were participants in the finished-task conditions (M=5.16; SD=1.60), $t(76)=5.97$, p=0.00, d=1.37.

To test the effectiveness of the time pressure manipulation, participants were asked to what extent they experienced time pressure when they worked on Task A (7-point Likert scale). After Task B, participants were also asked to what extent they experienced time pressure while working on Task B (7-point Likert scale) to make sure that the time pressure manipulation on Task A did not carry over to Task B. Participants assigned to the high time pressure conditions reported working under more time pressure on Task A (M= 4.78; SD= 1.44) than did participants assigned to the low time pressure conditions (M= 4.02; SD= 1.60), $t(76)=2.12$,

p=.04, *d*=0.5. Further, all participants reported similar levels of time pressure on Task B, independent of their time pressure condition on Task A (*M*=3.46; *SD*= 1.65).

Performance on Task B. Performance on Task B was based on the total number of accurate ideas that a subject recalled from the four resumes. Two different coders coded the accuracy of the information recalled. The two coders were blind to the experimental conditions and one of them was also blind to the research hypotheses. Reliability for those coders was satisfactory (*r*=0.95). The coding from the coder who was blind to the research hypotheses was then chosen to be used in the analysis.

Motivation to switch tasks. After working on Task B, participants were asked two questions on a 7-point Likert scale: 1) "When I was asked to stop working on the intelligence task [Task A], I didn't want to stop" and 2) "If I had had the opportunity, I would have preferred to finish the intelligence task [Task A] before switching to the resume task [Task B]." These two items were combined in an average score (*r*=.57, *p*=.000).

Confidence in Task A completion. Right after Task A, participants were asked to report the extent to which they felt confident that they had met the goal of Task A (7-point Likert scale).

Further analyses. Goal commitment on Task B was measured, after Task B, by asking participants to what extent they cared about (a) doing well on; and (b) demonstrating their competence in Task B. The two items were combined into one average score (*r*=.86, *p*=.000).

Results

A two-way multivariate analysis of variance (MANOVA) was used to examine between-participants effects of completion and time pressure on Task A on the major dependent variables (i.e. Task B performance, motivation to switch tasks, and confidence in Task A completion).

Results indicated significant main effects for both completion $F(3,70)=36.63$, $p=0.00$, $\eta^2 = .61$ and time pressure $F(3,70)=2.90$, $p=0.04$, $\eta^2 = .11$ (Wilk's Lambda). *t*-test analyses and univariate ANOVAs were then conducted for each of the dependent variables. Table 1 presents the relevant means and standard deviations.

< Insert Table 1 here>

Task B performance. Participants' performance on Task B was subjected to a 2 (completion on Task A) x 2 (time pressure on Task A) between-participants analysis of variance (ANOVA). Consistent with Hypothesis 3, a significant main effect of completion on Task A emerged, $F(1,74)=7.02$, $p=0.01$, $\eta^2 =0.09$, indicating that participants who finished Task A performed better on Task B ($M=55.30$, $SD= 20.04$) than did participants who did not finish Task A before switching tasks ($M=44.71$, $SD=18.39$). In addition, a significant main effect of time pressure emerged, $F(1,74)=4.84$, $p=0.03$, $\eta^2 =0.06$, indicating that participants who worked on Task A under high time pressure performed better on Task B ($M=54.32$, $SD=21.36$) than did participants who worked on Task A under low time pressure ($M=45.65$, $SD=17.45$). Consistent with Hypothesis 5, the interaction between completion and time pressure was also significant, $F(1,74)=4.06$, $p=0.05$, $\eta^2 =0.05$. As predicted, high time pressure had a significant main effect among participants who were assigned to the finished-task conditions, $t(36)=2.98$, $p=.005$, $d=.99$, such that participants who finished Task A under high time pressure performed better on Task B ($M=64.57$, $SD=21.07$) than did participants who finished Task A under low time pressure ($M=46.97$, $SD=15.17$). No such effect of time pressure emerged among participants who were assigned to the unfinished-task conditions ($p>.90$).

Motivation to switch tasks. Hypothesis 1 predicted that participants assigned to the finished-task conditions would be more motivated to disengage from Task A and switch to Task

B than would participants assigned to the unfinished-task conditions[3]. A *t*-test analysis comparing these conditions was then run and revealed that completion on Task A had a significant effect on participants' motivation to switch tasks, $t(76)=5.08$, $p=.000$, $d=1.17$. Participants who finished Task A were more motivated to switch to Task B ($M=4.43$, $SD= .94$) than were participants who did not finish Task A ($M=2.87$, $SD=1.65$).

Confidence in Task A completion. Hypothesis 6 predicted that within the completion conditions, participants who finished Task A under high time pressure as opposed to low time pressure would be more confident in having completed the goal of Task A. A *t*-test analysis comparing the finished-task/high time pressure condition and the finished-task/low time pressure condition revealed a significant main effect of time pressure, $t(37)=2.63$, $p=.01$, $d=.86$. Participants assigned to the finished-task/high time pressure condition were more confident in having met the goal of Task A ($M=6.10$, $SD=.99$) than were participants assigned to the finished-task/low time pressure condition ($M=4.80$, $SD=1.95$).

It was also confirmed that no such effect of time pressure emerged when participants were assigned to the unfinished-task conditions ($p>.50$). In addition, as might be anticipated, participants assigned to the unfinished-task conditions were overall less confident in having completed Task A ($M=2.23$, $SD=1.40$) than were participants assigned to the finished-task conditions ($M=5.44$, $SD=1.66$), $t(76)=9.184$, $p=.00$, $d=.21$.

Mediation analysis. I have argued that time pressure within the finished-task conditions would enhance Task B performance by increasing people's confidence in having reached the goal of Task A. Mediation analysis was performed following the steps recommended by Baron

[3] The effect on the motivation to switch tasks was argued to be driven by the need for completion, and no effect of time pressure was predicted. It was confirmed based on a 2 (completion) x 2 (time pressure) ANOVA that the main effect of time pressure and the interaction completion x time pressure were not significant.

and Kenny (1986). As in the analyses of variance, time pressure significantly predicted both performance on Task B (β=-.44, p=.005) and confidence in Task A completion (β=-.40, p=.012). In addition, confidence in Task A completion significantly predicted performance on Task B (β=.53, p=.001). A final regression analysis on Task B performance, including time pressure as independent variable and confidence in Task A performance as covariate, revealed a significant effect of confidence in Task A completion on Task B performance (β=.42, p=.007), while the effect of time pressure was reduced to marginally significant (β=-.29, p=.07). A calculation of the Sobel test showed that this reduction in β-weight for the effect of time pressure is significant (z=1.93, p=.05), confirming that the mediation is significant.

< Insert Table 2 here>

Alternative hypotheses. Participants who did not finish Task A before the switch had lower performance on Task B than participants who finished Task A. Since participants who did not finish Task A were also less motivated to switch to Task B, it is possible that their performance on Task B suffered because they were also less committed to performing well on Task B. To explore this alternative explanation, a 2 (completion: finished/unfinished) x 2 (time pressure: high/low) ANOVA with goal commitment on Task B as the dependent variable was performed. It revealed no significant main effects for completion or time pressure on Task A, and no significant interaction (p>.15). In addition, performance on Task B and goal commitment on Task B were not significantly correlated, r(78)=.06, *ns*, undermining the possibility of mediation. Similarly, the motivation to switch tasks and goal commitment on Task B were not significantly correlated, r(78)=-.00, ns. Even though not finishing Task A lowered the motivation to switch to Task B, this reduced motivation did not undermine participants' reported commitment to Task B. Lastly, an ANCOVA with performance on Task B entered as a

dependent variable and goal commitment on Task B entered as covariate yielded the same results as the ANOVA reported above.

Individual differences. A number of individual difference measures[4] were collected to test for covariation. Based on correlation analyses, none of the measures were significantly correlated with performance on Task B[5] with the exception of need for achievement. More specifically, when assigned to the unfinished-task conditions, participants who were high on need for achievement performed significantly better on Task B[6] (M=52, SD=18.78) than did participants who were low on need for achievement (M=38, SD=15.66), $t(38)$=-2.56, p=.015, d=.83, (r=.41, p=.008). A 2 (completion) x 2 (time pressure) ANCOVA on Task B performance, with need for achievement entered as covariate yielded similar results, suggesting no moderating effect of need for achievement. The main effect of need for achievement was significant, $F(1,73)=7.52$, p=0.008, η^2 =0.09.

Discussion

The act of transitioning between tasks has behavioral implications on subsequent task performance. Study 1 supports the idea that task performance suffers when a prior task is unfinished. Performance also suffers when people have completed the prior task under low time pressure. It is only when people have completed the prior task under high time pressure that their

[4] Individual difference measures included in the study were (a) need for achievement (Heckert et al., 1999.), which represents the desire to excel (α=.59); (b) polychronicity (Slocombe & Bluedorn, 1999), which represents the preference for doing several things simultaneously as opposed to sequentially (α =.75); (c) need for cognitive closure (Kruglanski, Webster, & Klem, 1993) (α =.68); (d) need for cognition (Cacioppo & Petty, 1982), which represents a tendency to engage in and enjoy effortful thinking (α =.84); and (e) state versus action orientation (Kuhl, 1994), which represents a tendency to act as opposed to ruminate (α=.58).

[5] Each of these individual difference measures were also entered as covariates in separate 2 (completion) x 2 (time pressure) ANCOVAs on Task B performance. Results were similar to the ANOVA reported above and none of the covariates (except need for achievement) were significant.

[6] To further explore the effect of need for achievement on Task B performance, I tested whether participants with a high need for achievement and assigned to the unfinished-task conditions performed as well on Task B as participants assigned to the finished-task/high time pressure condition. A t-test analysis revealed a marginally significant difference between the two groups, $t(35)=1.91$, p=.06, d=.65, such that participants assigned to the finished-task/high time pressure condition performed better on Task B than did participants with a high need for achievement who were assigned to the unfinished-task conditions.

subsequent task performance is enhanced. In line with Kruglanski's theory, Study 1 provides evidence that time pressure, when combined with task completion, increases people's confidence in their own accomplishments and, in this case, in having met of the goal of Task A. Moreover, the results indicate that, when Task A is finished, confidence in Task A completion mediates the effect of time pressure on participants' subsequent task performance. The results also show that not having finished a prior task reduces the motivation to switch to the next task.

Overall, this study demonstrates that, while performance on a current task suffers when a prior task is unfinished, completion of a prior task, by itself, is not always enough to help people transition to the next task and enable high performance. Time pressure, when coupled with task completion, provides the necessary incentive to transition tasks more effectively. Even though time pressure on a task makes it more difficult to reach task completion, when the two co-exist they provide the most favorable context for transitions in terms of subsequent task performance. While the focus of Study 1 was mainly on the behavioral implications of having to transition between tasks, Study 2 explores the cognitive implications of task transitions and more specifically the difficulty of transitioning attention from one task to the next.

Study 2

Study 2 was designed to focus on studying participants' disengagement from the goal of the first task (Hypothesis 2) and attention residue (Hypotheses 3 and 6) after they must switch tasks. Goal disengagement and attention residue were measured behaviorally by using a lexical decision task. This was done by testing whether the goal of Task A (when measuring goal disengagement) and the content of Task A (when measuring attention residue) stayed active in participants' minds after they switch tasks. A lexical decision task measures the level of activation of concepts in people's minds by asking them to recognize whether a stimulus (i.e. a

letter string) appearing on the computer screen is a real word or not (e.g. Martin & Tesser, 1996; Moskowitz, 2002). Reaction time tasks are based on the premise that the more active a concept is in a person's mind, the more accessible it is and the faster people will respond to stimuli related to that concept.

Participants and Design

Eighty-four undergraduate students (26 men; 58 women) from an Eastern university were randomly assigned to the 2 (completion: finished/unfinished) x 2 (time pressure: high/low) factorial between-participants design. Participants received $10 for their participation and the experiment was conducted in individual sessions of approximately 25 minutes each.

Procedure and Materials

The procedures were identical to Study 1, with one exception. A lexical decision task was introduced between Task A and Task B, and Task B was not performed. After having worked on Task A and answered the three manipulation check questions, Task B was introduced. Participants were reminded of the purpose of the second study [Task B] and explained what they needed to accomplish on that task. They were then told that before starting the second study, they needed to perform a short task on the computer. The task was the lexical decision task, which is a reaction time task commonly used to identify what thoughts are most active in a person's mind. After the lexical decision task, participants were debriefed. As in Study 1, the debriefing indicated that none of the participants realized the true nature of the experiment or guessed that Task A was not feasible.

Lexical decision task to measure attention residue. The lexical decision task was performed on a computer. Participants had to press specific keys on the keyboard to indicate whether the letter strings presented on the screen were real words or not. Participants' reaction

times and accuracy were recorded. The letter strings that were presented were from three categories: a) non words (for example: belrys); b) real "target" words that were chosen to measure the dependent variables (i.e. words related to the goal of Task A (i.e. complete, finish, etc.) to measure goal disengagement and content of Task A (i.e. actual clues from the word task) to measure attention residue); c) and real "neutral" words that were unrelated to the target words but were each matched, based on frequency in the English dictionary and number of letters, to one of the target words (for example: contribute, neutral word matching with the target word "complete")[7]. The neutral words would serve as base rate. For this lexical decision task, 15 pairs of target-neutral words and 30 non-word stimuli were generated and shown to participants.

Manipulations

The completion and time pressure manipulation instructions were identical to those used in Study 1. Responses to the two manipulation check questions indicated that the completion manipulation was effective. First, participants' perceptions of whether or not they completed Task A were consistent with the experimental conditions, which also corresponded to their actual performance. Second, participants in the unfinished-task condition reported that they were less satisfied with their performance on Task A (M=3.39; SD=1.50) than were participants in the finished-task condition (M=5.19; SD=1.37), $t(82)=5.74$, p=.000, d=1.27. The time pressure manipulation was also effective, as participants assigned to the high time pressure conditions reported working under more time pressure on Task A (M= 4.78; SD= 1.23) than did participants assigned to the low time pressure conditions (M= 4.05; SD= 1.46), $t(82)=2.44$, p= .02, Cohen's d=.55.

[7] The neutral words were used as a base line in reaction times for each subject. Word frequencies were found in Frequency Analysis of English Usage: Lexicon and Grammar (Francis and Kucera, 1982).

Measures

Attention residue was measured using the lexical decision task described above and was based on the activation level of five words that were directly taken from Task A. The number of target words was limited to five words to prevent the lexical decision task from lasting too long. These five words, which were five clues from Task A, were identified during pre-testing and represented the clues that participants kept thinking about the most when they did not finish Task A.

The more active a concept is (in one's mind), the more it attracts attention, and the more cognitive resources are devoted to it (e.g. Carver & Sheier, 1998, p202). As such, the higher the activation level of the words from Task A, the more active Task A was in the minds of participants' and the higher the attention residue. Higher activation levels (i.e. attention residue) are reflected in smaller reaction times. Reaction times for accurate answers[8] only were averaged to produce the measure of attention residue and matching neutral words served as base rate in reaction times.

Goal disengagement. Goal disengagement was also measured using the lexical decision task based on the activation level of four verbs associated with the goal of Task A (i.e. solve, finish, think, and discover). Goal disengagement is represented by a low activation of that goal in one's mind. That is, the lower the activation level of the verbs associated with Task A, the less active the goal was in the minds of participants and the higher the goal disengagement. Low activation levels (i.e. goal disengagement) are reflected in larger reaction times to the verbs representing the goal of Task A. Reaction times for accurate answers only were averaged to

[8] Accuracy rate: .95

produce the measure of goal disengagement and matching neutral words were used as base rate in reaction times.

Alternative hypotheses. The lexical decision task was also used to confirm that, in line with the pre-test, self-efficacy beliefs and perception of intelligence were not affected by the experimental story. S*elf-efficacy* was measured based on the activation level of three words (skilled, competent, and capable) and *intelligence* was measured based on the activation level of three words (smart, clever, and intelligence). Matching neutral words were also used as base rate.

Results

The reaction time data yielded two distinct dependent variables, attention residue and goal disengagement, which were the primary dependent variables in this experiment and two neutral matching groups that served as base rates[9]. The two dependent variables were first submitted to multivariate analysis of covariance, MANOCA, with the matching neutral groups entered as covariates. Consistent with Hypothesis 2, results indicated a significant main effect of completion on Task A, $F(2,70)=6.44$, $p=.003$, $\eta^2=.16$ and a significant Completion x Time pressure interaction $F(2,70)=3.77$, $p=.03$, $\eta^2=.10$. (See Table 3 for means and standard errors).

< Insert Table 3 here>

Each of the two dependent variables, attention residue and goal disengagement, was then subjected to a 2 (completion) x 2 (time pressure) x 2 (word type: target word versus neutral word) repeated measure analysis of variance (ANOVA). Target words were either the words used in Task A when attention residue was the dependent variable or the verbs representing the goal of Task A when goal disengagement was the dependent variable. Since the neutral words

[9] Following conventional procedures, response times to words that were not recognized as words and response times to individual words that were three standard deviations from the mean were excluded from the analyses. Finally, the response times were log transformed.

were used as base rates, a significant effect of completion (or time pressure) was to be reflected in a significant interaction between word type and completion (or time pressure).

Attention Residue. Consistent with Hypothesis 3, the analysis of attention residue revealed a significant Completion x Word type interaction, $F(2,79)=5.97$, $p= .02$, $\eta^2=.07$, such that participants assigned to the unfinished-task conditions responded faster to the clues from Task A (M=571ms), demonstrating more attention residue, than participants assigned to the finished-task conditions (M=612ms). No significant Time pressure x Word type interaction emerged, but the Completion x Time pressure x Word type interaction was significant, $F(2,79)=5.85$, $p= .02$, $\eta^2=.07$. As predicted, the Time pressure x Word type interaction had a significant effect among participants assigned to the finished-task condition $F(1,40)=5.70$, $p= .02$, $\eta^2=.12$, such that participants in the low time pressure condition responded faster to the clues from Task A (M=572ms), demonstrating more attention residue, than did participants in the high time pressure condition (M=651ms) (Hypothesis 6). As predicted, the Time pressure x Word type interaction did not have such an effect among participants assigned to the unfinished-task condition ($p>.28$).

Goal disengagement. Consistent with Hypothesis 2, the analysis of goal disengagement revealed a significant Task A Completion x Word type interaction, $F(1,77)=7.11$, $p=.01$, $\eta^2=.09$, such that participants assigned to the unfinished-task conditions responded faster to the goal of Task A (M=581ms), demonstrating that they did not disengage as much from the goal of Task A, than did participants assigned to the finished-task conditions (m=606ms). The Time pressure x Word type interaction and the Completion x Time pressure x Word type interaction were not significant. The Time x Word type interaction had no significant effect among participants

assigned to the finished-task conditions (p>.15) or among participants assigned to the unfinished-task conditions (p>.80).

Alternative hypotheses. Repeated measures ANOVAs on the activation levels of the self-efficacy and intelligence concepts revealed no differences across conditions. The same individual difference measures[10] as in Study 1 were collected to test whether some people experienced less attention residue than others, especially when it was difficult to close the mind to Task A (i.e. within the incompletion conditions and within the completion- low time pressure condition). None of the individual measures had a significant effect on the activation levels of the task content and task goal[11].

Discussion

Study 2 supported the prediction that switching tasks before having completed the first task makes it more difficult to disengage from the goal of the first task and is associated with more attention residue. Consistent with Hypothesis 2, the goal of Task A stayed significantly more active in the minds of those who did not finish Task A, thus demonstrating lower goal disengagement, than in the minds of those who finished Task A before switching tasks. Consistent with Hypothesis 3, the content of Task A stayed significantly more active in the minds of those who did not finish Task A, thus demonstrating more attention residue, than in the minds of those who finished Task A before switching tasks. These effects were revealed by faster reaction times to words associated with the goal of Task A and to the content of Task A, respectively.

[10] As in Study 1, individual variables such as polychornicity (α=.71), need for closure (α=.77), need for cognition (α=.70), need for achievement (α=.58), and action-state orientation (α=.55) were measured.

[11] When tested within each sub-sample, none of the correlations between each of the individual difference measures and the reaction times for 1) the task content and 2) the task goal were significant (the reaction times for the matching neutral words were partialled out). I also performed separate repeated measures of analysis of covariance, with the activation levels of the task content and task goal as dependent variables and the individual measures entered as covariates. These repeated measure ANCOVAs yielded the same results as the repeated measure ANOVAs reported above.

As predicted, having finished the first task contributes to goal disengagement, but does not necessarily reduce attention residue. Even though participants assigned to the finished-task conditions did not differ in the extent to which they disengaged from the goal of the first task, those who completed the first task under low as opposed to high time pressure reported more attention residue. This was revealed by the content of Task A staying more active in the minds of those who finished Task A under low time pressure than in the minds of those who finished Task A under high time pressure. Furthermore, it is attention residue and not goal disengagement that shows the same pattern of results as the one found for performance in Study 1. This confirms the importance of looking at attention residue and not just goal disengagement when studying transitions and more generally when looking at the effects of completion.

General Discussion

Two studies were conducted to understand how switching tasks affects people's ability to be fully present in their work and perform at their full potential. The present findings reveal that the act of transitioning between tasks has implications on how people engage in a subsequent task; switching attention tends to be difficult for people and subsequent task performance easily suffers. More specifically, factors associated with the first task – not having finished the first task before switching to the next one or having finished it under low time pressure - contribute to the difficulty of task transitions. People need to have both finished their first task and have done so under high time pressure to be able to switch their attention to the next task, thus exhibiting less attention residue and reaching higher subsequent task performance.

Compared to people who finished the first task, people who did not finish the first task exhibited more attention residue and lower subsequent task performance. Because the prior task

was unfinished, it continued to attract attention. The necessity of engaging in a subsequent task was not enough for people to overcome their motivation to finish the prior task and the attentional pull of that prior task. People who did not finish the first task were not less motivated to perform well on the subsequent task (Study 1), but rather found it difficult to disengage from the first task and regulate their attention between the two tasks (Study 2).

The solution to more effective task transitions is, however, not as simple as being able to finish the prior task. While completing a task before switching to another allows people to disengage from the goal of the first task, it is not enough to help people switch their attention to the next task. Even when task completion is obvious and reinforced by external feedback, as was the case in the two experimental studies, people find it difficult to fully free their mind from the finished task. The present findings show that when the first task was finished under low as opposed to high time pressure, people exhibited more attention residue and lower performance on the next task. Time pressure provided an additional necessary incentive to fully let go of the finished task. Time pressure increased people's confidence in task completion (Study 1) and helped them reach cognitive closure on that finished task, which was revealed by lower attention residue (e.g. Study 2). As a result, people had more cognitive resources available for the next task and their performance was enhanced.

Implications and Limitations.

The present research has both theoretical and practical implications.

Theoretical implications. There has been much research - both at the task and at the organizational level - studying the factors that motivate people to engage in their work and perform well. The present research suggests that task performance is not solely a function of the motivation to work on a given task, but should also be considered in a broader temporal context.

People need to disengage from prior work in order to be fully engaged and present at every moment of their task performance. Similarly, the present research suggests that the way people regulate their attention at work is not based solely on the current activity they must engage in. The prior activity and the way it was experienced also strongly influence on the regulation of attention. These findings and insights are relevant to the study of interruptions. The act of being interrupted in one's work is likely to hurt performance not only on the interrupted activity but also, as indicated by the present studies, on the subsequent work activity. This paper calls for understanding the consequences of interruptions and fragmented time beyond their effects on only the interrupted task.

Furthermore, the present research contributes to the literature on goal completion (Martin & Tesser, 1996; Moskowitz, 2002; Rothermund, 2003) and goal/task disengagement (e.g. (Wrosch et al., 2003). Whereas traditional research suggests that goal attainment or task completion leads to goal disengagement, it has not explicitly studied the effect of completion on people's ability to stop thinking about a task, that is, on their ability to reach cognitive closure. The present research reveals the importance of differentiating goal disengagement from cognitive closure when studying task disengagement, as it is only when people have reached cognitive closure on a completed task that they stop thinking about that task and fully transition their attention to a subsequent task. In other words, task completion leads to goal disengagement but not necessarily to cognitive closure; and cognitive closure is necessary for people to fully stop thinking about a task and reduce attention residue on a subsequent task.

The present research also contributes to the time literature. Most of the existing research has documented the detrimental effects of time pressure on a current task performance (DeDreu, 2003; Karau & Kelly, 1992; Kelly & McGrath, 1985). However, the effect of time pressure has

mainly been studied during the performance of a task, as opposed to after the completion of the task. The present findings reveal that time pressure on a completed task can be beneficial; it facilitates the process of transitioning to another task and thus contributes to higher subsequent task performance. By helping people reach cognitive closure on the finished task, time pressure incites them to let go of that task and therefore allows them to more fully switch their attention to the next task. There is, however, an ironical paradox associated with the combination of time pressure and task completion, as time pressure reduces the likelihood of finishing a task before one needs to switch to another. This suggests that task transitions are likely to occur in contexts that are often less favorable to task performance.

Limitations. Given that people have limited cognitive resources, task performance tends to suffer when people are distracted by unrelated stimuli (Schneider & Fisk, 1982). The effect of task transitions on subsequent task performance is then likely to be mediated by the way people regulate their attention between the prior and the subsequent task, that is, by attention residue. The present findings are consistent with a mediation effect, since both performance on task B and attention residue follow the same pattern of results across the experimental conditions. The experimental design, however, did not permit for actually testing for mediation. To test for mediation, the lexical decision task, measuring attention residue, should be administered before participants perform Task B. But the introduction of the lexical decision task changes the nature and flow of the transitions by adding a third task between Task A and Task B. Performance on Task B is then likely to be influenced by how participants experience not only Task A but also the lexical decision task, thus changing the nature of the study. Future research should explore whether attention residue mediates the effects of the experimental conditions on performance.

Furthermore, task completion in this paper was considered as a dichotomous variable (i.e. finished task/unfinished task). Future research should consider task completion as a continuous variable and explore whether performance on a second task depends upon the degree to which the first task is unfinished or how far one perceives him/herself to be from reaching the goal of the first task. Commitment to the first task or the importance or meaning of its goal may also influence the way people experience not having finished a task and thus may influence how they transition to the next task. The greater the importance or meaning attached to a task, or the more committed people are, the more not having finished a task is likely to be aversive (e.g. Martin & Tesser, 1996). These variables may then moderate the effect of an unfinished task on people's attention residue and their performance on the next task. Besides, in the present studies, the timing of the transition was kept constant across conditions. However, transitioning may be more difficult for people if they have to switch tasks at the peak of their concentration on the first task as opposed to when they are just beginning to work on the first task or have worked on it for a long time and have started losing their concentration. Future research should explore the importance of the timing of the transition (vis-à-vis the first task) on subsequent performance.

Managerial implications. In order to stay competitive, organizations and employees often strive to manage more tasks or projects at the same time, while keeping up with their fast-paced environment; but at what costs? People often fail at fully switching their attention when they switch tasks and their task performance tends to suffer. In other words, even when people are asked to work on only one of their tasks, their mind tends to multitask: that is, they tend to think about several tasks at the same time. Multi-tasking (i.e. doing several things *simultaneously*) has often been considered in terms of what people "do" and not necessarily in terms of what people "think about" or how they allocate their attention among their tasks. The present research

suggests that even when people are behaviorally focused on one task and are not multi-tasking, their minds may not be completely focused on the task at hand. In other words, multi-tasking may not only be due to competing simultaneous demands, like receiving an email or a text message during a meeting, but may also be a function of how the mind operates in a context where people must manage multiple tasks, activities or responsibilities at the same time.

The solution to being more present in and more concentrated on a given task may then not fully come from turning off one's Blackberry or working offline. Making people manage only one task at a time is not likely to be a practical solution either. The issue is then to understand what can aid people in switching tasks, that is, what can help them temporarily close their minds to one task when they must concentrate on another. Time pressure seems to be beneficial when people complete their task, but it also makes it less likely that people will be able to finish that task. Could people anchor on having reached a milestone or an intermediate goal to temporarily close their minds to a task and thus be able to transition their attention to the next task? This is another question that future research should address. Research on mindfulness may also bring interesting insights. Some studies suggest that people may be able to train their minds to be more fully focused on the present (e.g. Zabat-Zinn, 2005). Such an approach may also help people regulate their attention at work based on their current work activities as well as reduce the impact of prior work activities on their minds.

Table 1

Means and standard deviations for performance on Task B, motivation to switch and confidence in Task A completion – Study 1.

	Finished Task A		Unfinished Task A	
	High time pressure	Low time pressure	High time pressure	Low time pressure
Confidence in Task A completion[1]				
Mean	6.10 [a]	4.80 [b]	2.42 [c]	2.05 [c]
SD	(0.99)	(1.95)	(1.35)	(1.47)
Motivation to switch tasks[1]				
Mean	4.47 [a]	4.40 [a]	2.95 [b]	2.80 [b]
SD	(0.85)	(1.03)	(1.69)	(1.66)
Performance on Task B[2]				
Mean	64.57 [a]	46.97 [b]	45.10 [b]	44.32 [b]
SD	(21.07)	(15.17)	(17.39)	(19.78)

Note. [a,b,c] Cell means not sharing the same superscript differ at $p<.05$

[1] Confidence in Task A completion and motivation to switch were measured on a 7-point Likert scale.

[2] Performance on Task B was measured based on the total number of accurate ideas recalled.

Table 2.

Regression results testing the mediation by confidence in Task A completion of the relationship between time pressure and performance on Task B within the finished task conditions – Study 1.

	Task B performance	
	Column 1 (main effects)	Column 2 (mediation)
Independent variables	β	β
Time pressure	-.44**	-.29†
Confidence in Task A completion		.42**
Overall F	8.86**	9.36***
df	1, 36	2, 35
R^2	.20	.35
Change in R^2 compared to column 1		.15
F change		8.12**

Note: standardized regression coefficients are shown

† $p < .10$; * $p < .05$; ** $p \leq .01$; *** $p \leq .001$

Table 3

Means and Standard Error for reaction times (ms) – Lexical Decision Task- Study 2.

	Finished Task A		Unfinished Task A	
	High time pressure	Low time pressure	High time pressure	Low time pressure
Attention residue[1]				
Mean	651.42 [a]	572.12 [b]	574.97 [b]	566.82 [b]
S.E.	(26.95)	(17.63)	(31.14)	(24.20)
Base line (i.e. matching neutral words)				
Mean	647.66	627.82	661.60	618.77
S.E.	(28.77)	(17.12)	(28.06)	(20.70)
Goal disengagement[1]				
Mean	621.86 [a]	584.44 [a]	584.51 [b]	578.37 [b]
S.E.	(31.79)	(15.99)	(33.68)	(23.45)
Base line (i.e. matching neutral words)				
Mean	595.25	592.89	637.49	605.29
S.E.	(26.99)	(23.01)	(34.98)	(24.17)

Note. [a,b,c] Cell means not sharing the same superscript differ at $p<.05$.

[1] Reaction times are measured in milliseconds (ms).

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