12-2020

The Negative Effects of Interruptions on Job Performance and Affective Well-Being

Christopher James Juszczyk

The Negative Effects of Interruptions on Job Performance and Affective Well-Being

by

Christopher James Juszczyk

A thesis submitted to the College of Psychology and Liberal Arts of
Florida Institute of Technology
in partial fulfillment of the requirements
for the degree of
Master of Science

in

Industrial/Organizational Psychology

Melbourne, Florida

December 2020

We the undersigned committee hereby approve the attached thesis,
"The Negative Effects of Interruptions on Job Performance and Affective Well-Being"

by
Christopher James Juszczyk

_____
Patrick Converse, Ph.D.
Associate Professor
Industrial/Organizational Psychology
Major Advisor

_____
Xinxuan Che, Ph.D.
Assistant Professor
Industrial/Organizational Psychology

_____
Ted Petersen, Ph.D.
Associate Professor
Communications

_____
Lisa Steelman, Ph.D.
Professor and Dean
College of Psychology & Liberal Arts

Abstract

The Negative Effect of Interruptions on Job performance and Affective Well-Being

Christopher J. Juszczyk

Patrick Converse, Ph.D.

Workplace interruptions are an increasingly prominent and potentially consequential issue. Most studies have found that interruptions can have serious negative consequences for both job performance and affective well-being. However, very little research has examined the specific effects of internal and external interruptions. In addition, there has been limited research on factors that may mitigate the effects of interruptions. This study examined these issues, focusing on (a) the effects of internal and external interruptions on both job performance and affective well-being as well as (b) polychronicity, contingent planning, and task-switching ability as moderators of these relationships. The study involved two major components: assessment of these individual differences that may act as moderators and a daily diary approach to examine interruptions, job performance, and affect over a 10-day period. The data were analyzed using multilevel modeling in R. Both internal and external interruptions were found to be negatively related to job performance and affective well-being. Polychronicity, contingent planning, and task-switching ability were not found to be significant moderators of the Level 1 relationships. This study supports previous research on the negative effects of interruptions; however, other interruption-resistant traits, strategies, and abilities need to be explored

Table of Contents

List of Tables

Chapter 1
The Negative Effect of Interruptions on Performance and Affective Well-Being

Today's world fully embraces technology. Although technology at work has made our lives easier in many ways, it leaves us more vulnerable to interruptions. The increase in technology-mediated communication among employees, for instance, has made it more challenging for those at work to complete tasks from start to finish. This is particularly problematic in jobs where there are many types of tasks to be completed (e.g., knowledge worker positions). In addition, interruptions often have negative consequences: they can disrupt the individual during a task and even prevent task resumption, influencing performance. In other words, interruptions lead to multitasking which can interfere with task progress and goal attainment (Adler & Benbunan-Fich, 2013).

Interruptions are thus important to study because they are very common and consequential in work settings. Given that we cannot prevent most interruptions, examining the effects they have on the individual and factors that may mitigate these effects is vital. Research has begun addressing these issues, but our understanding is still limited in several ways. For instance, prior studies have often examined interruptions in general (Kirchberg, Roe, & Eerde, 2015; Stocker et al. 2018). Although informative, this work has largely ignored different types of interruptions and their associated effects. Using a more refined definition of interruptions, the cognitive mechanisms during the interruption process can be more easily understood. For example, internal interruptions that are initiated by the individual may have different implications from external interruptions that are due to outside factors, but this issue has received very little attention (see Werner et al., 2012, for an exception). In addition, previous efforts related to mitigating

interruptions have often come from managerial and office design perspectives. Sykes (2011), for example, proposed an office layout that would reduce the amount of visual distractions in the individual's office space. Others suggest simply educating employees on interruptions and their negative effects (Long & Stanley, 2012). Less popular, however, is proposing trait and skill-based approaches to combat the effects of interruptions (see Zide, 2017).

The proposed study is designed to address these limitations in prior research. First, this study examines both internal and external interruptions. Internal interruptions are those caused by the self, where there is an absence of external triggers (Adler & Benbunan-Fich, 2013). In contrast, external interruptions are a result of an external source (Jett & George, 2003). Breaking down interruptions into externally and internally caused may be useful, as there are theoretical reasons for thinking these may have somewhat different effects. Furthermore, finding which type of interruption is more detrimental to job performance and affective well-being will give better direction on how to deal with interruptions within an organization. If internal interruptions are found to be more detrimental, then selecting individuals into organizations who are more resistant to them may be the most beneficial. However, if external interruptions are found to be more detrimental, then further managerial and organizational solutions may be necessary.

Second, this study investigates multiple buffers to the negative effects of interruptions: polychronicity, contingency planning, and task-switching ability. Examining a personality trait (polychronicity), interruption resistance strategy (contingency planning), and ability (task-switching ability) can provide a more comprehensive and diverse way to address interruption resistance (see Figure 1 for all hypothesized relationships). This is a potentially useful approach because it is

clear that interruptions are prevalent in organizations and are not going away. Furthermore, the proposed solutions related to interruptions have focused largely on reducing external interruptions (see Sykes, 2011; Long & Stanley, 2012). Although taking measures to reduce both internal and external interruptions would be beneficial, they are often unavoidable (Galluch et al., 2015) and therefore there is a need to identify factors that may reduce the effects of interruptions. Thus, the purpose of this research is to address these two issues. In this paper, interruptions will be defined, relevant theories will be explained, outcomes of interruptions will be discussed, the differences between external and internal interruptions will be described, and individual differences as buffers to the negative effects of interruptions will be examined.

Interruptions Definition

Several major frameworks have been proposed to better understand and classify interruptions. From a managerial perspective, Jett and George (2003) proposed four types of interruptions: intrusions, breaks, distractions, and discrepancies. Intrusions were defined as "an unexpected encounter initiated by another person" (p. 495); breaks as "planned or spontaneous recess from work that interrupt the task's flow and continuity" (p. 497-498); distractions as "external stimuli or secondary activities that interrupt focused concentration on a primary task" (p. 500); and discrepancies as "perceived inconsistencies between one's expectations and immediate observations that are perceived to be relevant to both the task at hand and personal well-being" (p. 502).

Conceptually distinct from the managerial framework of interruptions is Couffe and Michael's (2017) cognitive perspective on interruptions. Couffe and Michael, (2017) define interruptions as having four criteria: "a primary task is suspended

temporarily; there is the intention to return and complete it; the new task (i.e., interruption task) is introduced by an event, unanticipated or not; and the event can be either external or internal to the person" (p. 165). When this interruption occurs, it interferes with goal progress and can cause a decrease in accuracy and speed and an increase in perceptions of workload. This paper focuses specifically on the distinction between externally and internally initiated interruptions that cause task switching. Mark, Gonzalez, and Harris (2005) defined external interruptions as "those that stem from events in the environment" and internal interruptions as "those in which one stops a task of their own volition." (p. 322).

Directly related to the interruption process are the concepts of task switching and goals. An interruption alert is an instance when an individual is first subjected to the interruption. Task switching occurs after the interruption alert when an individual decides to switch attention and focus to the interruption task (Couffe & Michael, 2017). This conceptualization of interruptions thus does not include momentary suspension from the primary task. For the purposes of studying task-switching, a goal is defined as "an intention to accomplish a task, achieve some specific state of the world, or take some mental or physical action" (Altmann & Trafton, 2002, p. 39). The issue with task switching is that it distracts from the primary goal and takes up more time towards the interruption task, which is not congruent with the individual's initial intentions.

Theoretical Models

Several theoretical models have been developed that are relevant to explaining interruptions and their effects. Major examples are reviewed next to provide theoretical background.

Memory for Goals

The memory for goals model proposed by Altmann and Trafton (2002) was developed to explain what happens when new goals are introduced. This model focuses on cognitive processes in that it addresses in depth what occurs when a secondary goal becomes activated, interfering with the original primary goal. The secondary goal in this case would be referred to as the interruption task. The memory for goals model suggests that the attention or activation for a current/primary goal gradually fades over time. Activation means that the goal is present in the person's mind and has his/her attention. After initial activation, primary goal activation naturally fades over time. However, when a secondary goal (interruption task) is introduced, this secondary goal has a higher activation level and thus this becomes the focus of attention and primary goal activation can fade substantially. The core issue and relevance of this model is that when the individual attempts to recall the primary goal and resume progress after the secondary goal (interruption task), it is more difficult to do so because of reduced activation of the primary goal and interference from the secondary goal due to task-switching (Altmann & Trafton, 2002). That is, upon switching focus to the secondary goal, if that goal requires lots of attention and resources, it can interfere with reactivation of the original, primary goal. In order to retrieve and reactivate the primary goal, priming needs to take place. For example, if the primary goal was writing a report, upon completing the interruption task the individual might need to ask him/herself something like "where was I in the writing process?" If a considerable amount of time passes working on a secondary goal, the primary goal could decay to the point that resumption of the primary task does not occur (Altmann & Trafton, 2002). In other words, the primary goal may no longer have the attention of the individual, and task-switching back to the original task may never occur.

DETOUR

The DETOUR framework (Couffe & Michael, 2017) was developed to more thoroughly explain the cognitive mechanisms and factors involved in task-switching, and consists of decision, encoding, task switching, operating and updating, and resumption. The decision stage occurs when an internal or external interruption is experienced, and the individual's attention is pulled from the primary task. This model expands on the memory for goals framework by proposing three separate possibilities immediately following an interruption. The individual can ignore the interruption task and immediately restart pursuing the primary goal, simultaneously work on both primary and secondary goals, or switch to the interruption task. For the purposes of this paper, only switches resulting from an interruption will be examined. The encoding stage occurs immediately following an interruption before task-switching. This involves storing goal progress in order to resume more efficiently upon completing the interruption task. The task-switching stage involves stopping work on the primary task and beginning the interruption task. Operating and updating includes focusing attention on the interruption but also maintaining parts of the primary task. Finally, the resumption component involves task switching back to the primary task and recalling components of the primary task to resume more efficiently (Couffe & Michael, 2017). Although ignoring the interruption task and continuing to work on the primary goal seems like an adaptive response, the nature of the interruption and the perceived value of the task could result in other decisions. If the interruption does not require a significant amount of effort and it is not ignored, simultaneous dual tasking will occur (Couffe & Michael, 2017). Given that most organizational interruptions will require more attention and will last for more than a few seconds (Werner et al., 2012; Sykes, 2011; Long & Stanley, 2012; Conrad et al., 2017) task switching is likely to occur.

Resource Allocation Theory

Resource allocation theory (Kanfer & Ackerman, 1989) was developed to address ability and motivation in the context of task performance from a limited resource perspective. This theory further supplements the idea that cognitive processes involved with interruptions give insight into responses to them. The theory suggests that individual differences in cognitive ability are related to levels of attentional resource availability that directly impacts performance (Kanfer & Ackerman, 1989). In addition, motivation is viewed as involving the allocation of those resources to during task performance. The likelihood of goal attainment then involves the interaction between ability and motivation (Kanfer & Ackerman, 1989). This is relevant to interruptions because attentional resources are seen as limited. If individuals are interrupted and have to shift attentional resources to the interruption task, then they have fewer resources for the primary task.

Executive Functioning Failure

The executive functioning failure theory (McVay & Kane, 2010) is a theory largely developed to explain the causes of mind-wandering, a type of internal or self-interruption involving engaging in task-unrelated thoughts. Task unrelated thoughts are any unrelated thoughts that do not assist with obtaining one's primary goals. In this theory, mind-wandering is seen as a failure of executive control over thoughts (McVay & Kane, 2010). When the mind wanders to off-task thoughts, this suggests that executive functioning has temporarily failed in that attention has shifted from the primary task to internal task-unrelated thoughts. These thoughts seem to occur due to a lack of resources, with the model suggesting that mind wandering can be prevented through engagement of the executive control system.

Summary

These cognitive frameworks provide insight into the timeline of an interruption and possible responses to them. The memory for goals model shows how keeping one's attention focused on the original goal can be beneficial to returning to the primary goal. The DETOUR framework shows that, depending on how complicated the interruption task is, ignoring the task, dual-tasking, or task switching can occur. The resource allocation theory gives additional insight into individual differences in task performance related to ability and motivation. Finally, executive function failure suggests executive resources play a role in resisting interruptions. All of these models and theories complement each other and help illustrate what occurs post interruption and give insight into what may allow for an individual to be more resistant to interruptions.

Outcomes of Interruptions

Interruptions have a variety of negative outcomes. Interruptions can be very costly to an organization, as they can take up to around 28% of a knowledge worker's day (Long & Stanley, 2012) and 5.7 hours per day for management positions (Sykes, 2011). These interruptions can then directly impact the employee's performance. For example, evidence indicates that internal interruptions can result in lower accuracy on tasks (Adler & Benbunan-Fich, 2013). Bathege and Rigotti (2013) suggest the drop in task accuracy could be due to increases in mental demands and increased feelings of time pressure. An interruption task that requires attention can cause the new goal to be prioritized (Unsworth, 2018). A change in goal prioritization can result in failure to return to the primary task, with evidence indicating that interruptions lasting 10 seconds or more have only an 83.7% resumption rate (Conrad, Barbour, & Marsh, 2017).

Interruptions can also be a major issue for patient safety, as interruptions are found to be the cause of as much as 43% of prescription errors (Werner et al. 2012).

Workplace interruptions can affect more than just performance outcomes. Interruptions also have significant effects on well-being (Baethge & Riggoti, 2015; Fletcher et al., 2017). For instance, cumulative interruptions have been shown to predict job satisfaction and psychosomatic complaints (Keller, Meier, Elfering, & Semmer, 2019). Interruptions resulting in multitasking can also lead to higher levels of stress (Robinson & Smallman, 2006). The cognitive demands required by task-switching can also lead to the depletion of resources and negative emotions (Zijlstra et al., 1999). These cumulative interruptions could lead to more distal outcomes such as burnout and turnover. Those who prefer to work solely on one task at a time and are subjected to interruptions are likely to experience even more negative affective outcomes.

Although interruptions are generally seen as negative, there may be some benefits. For example, breaks could be used as a necessary task switch that allows for one to recover mental resources. A reasonable amount of time on breaks of up to one hour per day was actually found to improve job performance (Coker, 2011). This suggests that internal interruptions have implications for recovery but would likely be most beneficial between primary tasks and not as a task switch in the middle of a task. Some types of external interruptions might also have benefits. For example, an interruption by a co-worker or supervisor may result in important information that actually could improve performance or notify the individual that a different direction needs to be taken (Jett & George, 2003).

Internal Versus External Interruptions

Interruptions are the antecedents to task switching because interruptions shift the individual away from the primary task (Kirchberg & Roe, 2015). The difference between internal and external interruptions is important to examine, as they may have differing levels of negative impacts on performance and affective well-being. As noted previously, internal interruptions consist of any switch from a primary task to an interruption task that is self-caused. External interruptions consist of any switch from a primary task to an interruption task that is caused by an external source. An interruption task can be defined by anything that shifts the employee's attention away from the primary task to something else. Therefore, an interruption task can be something non-work related. For the purposes of this research, interruptions are defined as involving a switch from one task to another or to something non-work related. Even a momentary switch from the primary task to something else can be considered task-switching.

Generally, studies have examined interruptions as a whole or used the taxonomy laid out by Jett and George (2003) to examine specific types of interruptions. However, a few studies have distinguished between internal and external interruptions. Fletcher, Potter, and Telford (2017), for example, developed a measure based on Jett and George's taxonomy that distinguishes internal and external interruptions. The main difference is that discrepancies (from Jett & George, 2003) are called rumination and are broadened to include both discrepancies and mind wandering. Breaks and rumination are then conceptualized as internal interruptions and intrusions and distractions are conceptualized as external interruptions. However, using this conceptualization of internal versus external interruptions is not as useful when focusing on interruptions that involve task-switching. This is due to some of the types of breaks and distractions

consisting of interruptions that do not result in task switching. Given the focus of the current study is on interruptions that involve task switching, it is more beneficial to combine the task-switching perspective with Mark et al.'s (2005) definition for the subtypes of interruptions. This splits interruptions into internal interruptions, "those in which one stops a task on their own volition," and external interruptions that "stem from events in the environment" (Mark et al., 2005, p. 322). Although Mark et al. indicate that some interruptions do not result in task switching, those that do are considered the most severe. Therefore, our framework will target interruptions resulting in task switching and use Mark et al.'s (2005) conceptualization of interruptions.

This is also consistent with other research. For instance, Werner et al. (2012) examined interruptions experienced by pharmacists, focusing on the source of the interruption for the pharmacists. The interruptions were conceptualized as simply being internally or externally caused. They found that internal interruptions resulted in shorter task resumption time than external interruptions as there was a shorter amount of time in switching back to the primary task. In addition, the frequency of internal and external interruptions was approximately equivalent.

Performance

For the purpose of this study, the in-role behavior dimension of performance will be examined (Williams & Anderson, 1991). In-role performance consists of all the behaviors necessary for the completion of one's work. Both internal and external interruptions are likely to have negative effects on this performance dimension for several reasons. At a basic level, interruptions take time and spending less time on the primary task reduces performance. For example, switching from a primary task to an interruption task as well as switching back to the primary task again involves

executive functioning in order to inhibit task-set information (Monsell, 2003). This inhibition may result in costs to both speed and accuracy regardless of the cognitive task. In addition, according to the memory for goals model (Altmann & Trafton, 2002), both internal and external interruptions may result in primary goal activation decay, making it less likely individuals will switch back to the primary task, which in turn undermines performance. Furthermore, internal interruptions could signify executive functioning failure (McVay & Kane, 2010) that may hinder primary task performance. As for external interruptions, they are moderately correlated with employee strains and they may be more anxiety-provoking (Rogers & Barber, 2019), which may have negative implications for performance. Given these considerations, more frequent internal and external interruptions are likely associated with lower performance.

H1a: Internal interruptions will be negatively related to performance.

H1b: External interruptions will be negatively related to performance.

Affective Well-Being

Affective well-being consists of the accumulation of affect. It reflects both the frequency of positive affect and the infrequency of negative affect (Diener & Larsen, 1993). Successful navigation of daily interruptions can be challenging. A higher frequency of internal interruptions indicates improper resource allocation and/or executive functioning failure. Frequent task switching and primary task resumption results in cognitive resource depletion and can produce negative emotions (Zijlstra et al., 1999). Multitasking or switching between primary and interruption tasks can be stressful and cause anxiety or mood changes (Becker, Alzahabi, & Hopwood, 2013). Less time towards one's primary goals and feelings

of lack of goal progress can also cause feelings of shame (Turner, Husman, & Shallert, 2002). Indeed, internal interruptions are found to be negatively related to affective well-being (Baethge, Rigotti & Roe, 2015; Fletcher et al., 2017; Kirchberg & Roe, 2015). In addition, external interruptions have a negative relationship with affective well-being due to increased feelings of strain and time pressure (Wheelock et al., 2015; Kirchberg & Roe, 2015; Stocker et al., 2015).

H2a: Internal interruptions will be negatively related to affective well-being.

H2b: External interruptions will be negatively related to affective well-being.

Comparing Internal and External Interruptions

Although both internal and external interruptions may have effects on performance and well-being, these effects could differ in strength. Some considerations suggest that internal interruptions may be less problematic than external interruptions. There is some evidence to suggest that a warning for an interruption can help prepare the individual and improve task resumption following the interruption (Labonté, Tremblay, & Vahon, 2019). This lends support to the memory for goals model in that the awareness of the interruption allows time to encode information about progress on the primary task in order to make task resumption easier (Couffe & Michael, 2017). This may provide support for the notion that internal interruptions may be less harmful due to the knowledge of an approaching self-interruption which could allow for preparation, whereas external interruptions may be more sudden. For example, if an individual knows he/she will soon stop working on a report and instead reply to emails (internal interruption), he/she may get to a reasonable stopping point in the report (e.g., completing a major section) before switching. In this case, the progress stopping point can be encoded into memory,

the goal will be less susceptible to decay, and it will be easier to resume progress on the report after completing this interruption task. In contrast, if an unexpected interruption is experienced, this may occur in the middle of a section (external interruption). In this case, there would not be time to encode the relevant components of the task into memory and it would be more difficult to retrieve this information related to task progress and resume following the interruption (Altmann & Trafton, 2002). Thus, uncontrollable external interruptions that result in task switching may be particularly difficult for an individual.

However, other perspectives might suggest that internal interruptions are more problematic than external interruptions. For instance, frequent internal interruptions can signify executive functioning failure or that the individual has a lesser ability to resist interruptions (Kanfer & Ackerman, 1989). Therefore, internal interruptions could be more detrimental because once the individual has fewer resources to resist interruptions and avoid task switching, then it could result in less primary goal progress or poorer performance as well. In addition, internal interruptions could be seen as more stressful because they are self-caused as opposed to external interruptions being outside the individual's control.

RQ1: Will internal or external interruptions have stronger negative relationships with (a) performance or (b) affective well-being?

Individual Differences

Due to the inevitability of interruptions in the workplace, it might be beneficial to select individuals who are naturally resistant to these events. Thus, this research also examines individual differences that may be relevant to the experience and consequences of interruptions. The focal individual differences

(polychronicity, contingent planning, and task-switching ability) were selected to give a broader view of the individual and to attempt to explain more variance in the frequency and outcomes of interruptions. There has been a general lack of research on individual differences related to interruption resistance; however, polychronicity (Kirchberg & Roe, 2015) and the contingent planning strategy (Parke et al., 2018) may relate to interruption frequency and have shown some promise for reducing the effects of interruptions. In addition, task-switching ability may not reduce the frequency of interruptions but when they occur, those higher in this ability should be better at handling task-switches.

Polychronicity

Polychronicity is a stable trait that assesses preferences for multitasking. Poposki and Oswald (2010) defined polychronicity as "an individual's preference for shifting attention among ongoing tasks, rather than focusing on one task until completion and then switching to another task" (p. 9). The definition of polychronicity suggests that high polychronic individuals are more susceptible to internal interruptions. Due to their preference to multitask, they will likely engage in internal interruptions because that is how they prefer to go about completing tasks (Kirchberg & Roe, 2015). Given that workplaces today have constantly changing demands, a constant stream of information, and a higher emphasis on speed of completion, multitasking is inevitable. However, individuals generally have some level of autonomy over how they set up their workday and how they go about completing tasks. Those who are high in polychronicity may select situations that allow them to be more frequently interrupted and therefore multitask more frequently. For example, if an individual prefers working with or around people, the likelihood of them being interrupted is higher. Therefore, the situations they tend to select are interruption prone.

H3: Polychronicity will be positively related to (a) internal and (b) external interruptions.

Because interruptions are inevitable, high polychronic individuals may better use their resources and time by navigating between tasks more successfully (Kirchberg & Roe, 2015). Even if not required or faced with external interruptions, high polychronic individuals may choose to multitask. Thus, although those high in polychronicity may subject themselves to internal interruptions more frequently (Duckworth et al., 2016), they may deal with these interruptions more effectively as well. For example, based on the memory for goals model, a high polychronic individual may have had more practice task-switching, and therefore may be more skilled at encoding necessary task components and retrieving necessary goal cues (Altmann & Trafton, 2002). Therefore, polychronicity could be a trait that helps provide protection against the negative effects of interruptions through practice and experience with task-switching. Prior research is consistent with this idea, as high polychronic individuals are not as affected by interruptions in terms of performance (Kirchberg & Roe, 2015).

H4: Polychronicity will moderate the negative relationship between (a) internal and (b) external interruptions and performance such that when polychronicity is high, the relationships are weakened.

Similarly, if high polychronic individuals prefer multitasking, the negative effects on well-being outcomes may be reduced as well. The feelings of increased strain, time pressure, and other associated well-being outcomes may not apply to those who can adapt more effectively to high rates of interruptions (see Wheelock et al.,

2015; Kirchberg & Roe, 2015; Stocker et al., 2015). In addition, high polychronic individuals prefer to multitask so they may enjoy dealing with interruptions.

H5: Polychronicity will moderate the negative relationships between (a) internal and (b) external interruptions and affective well-being, such that when polychronicity is high, the relationships are weakened.

Contingent Planning

Contingent planning (CP) involves thinking of possible interruptions or events that may happen that affect one's work and having a plan in case they occur (Mumford, Schults, & Van Doorn, 2001). This is a strategy that consists of daily work planning in order to be more resistant to both external and internal interruptions. This requires an awareness of one's goals, progress, and discrepancies. Those who have this awareness are expected to be higher performers as they achieve a higher proportion of their goals (Parke et al., 2018). Although looking at day to day CP is useful, this study is interested in one's CP as a trait. This trait involves the extent to which individuals tend to consistently engage in CP.

Having a plan for when interruptions occur can help buffer the effects of external and internal interruptions on job performance. For example, if the individual expects an interruption to occur, this expectation can reduce the negative impact the interruption might have (Parke et al., 2018; Labonté, Tremblay, & Vachon, 2019). Drawing from the memory for goals model, those who plan ahead to be inevitably interrupted may be more resistant to interruptions and able to achieve more throughout the workday. For example, being prepared for interruptions will provide a means to be aware of one's goal progress, resulting in higher activation levels, which will prevent goal decay (Altmann & Trafton, 2002).

H6: CP will moderate the negative relationships between (a) internal and (b) external interruptions and performance such that when CP is high, the relationships are weakened.

To my knowledge, there have been no previous studies looking at CP and affective well-being. However, CP may reduce daily feelings of stress stemming from interruptions by allowing the employee to develop flexible plans when interruptions do occur (Parke et al., 2018). Therefore, even with higher levels of interruptions, the employee will have a plan in place before the fact and feel less stressed from interruptions as a result. That is, if an employee does nothing to prepare for interruptions, then they could be perceived as more stressful and increase employee strain (Rogers & Barber, 2019). People who are high in CP may do things like make a list of tasks or prioritize tasks, which could help ease the demands of task switching. Those low in CP likely do not have backup plans and will not be as prepared to encode necessary components of the primary task (Altmann & Trafton, 2002). Furthermore, high CP can facilitate goal accomplishment, thus reducing feelings of shame associated with not accomplishing one's goals (Turner et al., 2002).

H7: CP will moderate the negative relationships between (a) internal and (b) external interruptions and affective well-being, such that when CP is high, the relationships are weakened.

Task-switching ability

To accompany the trait of polychronicity and the strategy of CP, an ability that represents an immunity to the negative effects of interruptions would be useful. This research focuses on task-switching ability. Task switching is a shift between

cognitive tasks. Those higher in task-switching ability have reduced switch cost, meaning they do so with fewer errors and have higher performance levels post task switch (Monsell, 2003). Task switching can be considered synonymous with sequential multitasking, where one switches attention between tasks. A measure of task switching (multitasking) ability provides a way to assess literal task-switching ability as opposed to self-report. For example, a measure of task-switching ability might entail assessing one's reaction time in switching from one task to another and the performance or accuracy on the tasks at hand. This type of measure provides a way to assess switching ability in an objective way. Those who are high in task-switching ability likely have a greater number of resources and are able to maintain higher levels of primary goal activation (Altmann & Trafton, 2002). Higher levels of primary goal activation are beneficial in preventing goal decay when interruptions occur. Activation levels higher than average are thus likely to be beneficial to job performance in that they will lead to a higher frequency of primary goal completion.

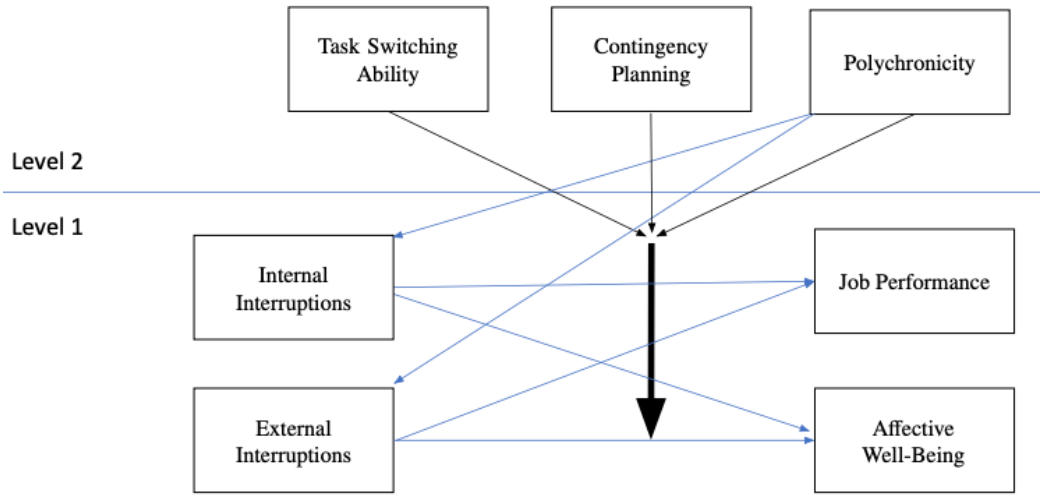
H8: Task-switching ability will moderate the negative relationships between (a) internal and (b) external interruptions and performance, such that when task-switching ability is high, the relationships are weakened.

Although there do not appear to be any previous studies on task-switching ability and affective well-being, those who are able to switch more efficiently likely will not only perform better but also be less stressed while doing so (Baethge & Rigotti, 2013; Baethge et al., 2015). Task-switching ability may help with ease of switching between tasks, causing the individual to perceive the switch as less stressful. Although those high in task-switching ability may not necessarily prefer multitasking, the negative well-being outcomes could be minimized due to a

decreased perception of strain and time pressure (Wheelock et al., 2015; Kirchberg & Roe, 2015; Stocker et al., 2015).

H9: Task-switching ability will moderate the negative relationships between (a) internal and (b) external interruptions and affective well-being, such that when task-switching ability is high, the relationships are weakened

Figure 1
Conceptual Model



Note: Each level 2 variable moderates every relationship at level 1

Chapter 2

Method

Participants and Procedure

Participants were gathered from various organizations across the US using Mturk. Any full-time workers were eligible to participate. A multilevel power analysis was conducted using a tool provided by Mathieu, Aguinis, Culpepper, and Chen (2012) in order to determine necessary sample size. Assuming a cross-level interaction effect on the lower end of the coefficients simulated by Mathieu et al. (.148) and an average of a 70% response rate for a 10-day daily survey, 100 participants would result in power of approximately .835 and 150 participants would result in power of approximately .965. Therefore, the goal was to recruit around 150 participants.

Initially, 1,045 participants were recruited. The participants were screened in multiple phases. First, participants completed a screening survey to determine whether they were working full time. Participants working less than 32 hours per week on average were removed (n = 430). Second, participants who did not complete the attention check successfully in the screening survey were removed (n = 47). This attention check was an item that asked the respondents to select a specific response. The qualified participants (n = 568) were invited to take part in an individual differences survey. The participants were screened in this phase in two ways. First, participants who did not complete the attention checks successfully were removed (n = 8). Second, participants who had only completed the

demographic section but not any of the measures or the task for the Level 2 variables were removed (n = 27). This screening plus dropout from the screener survey to the individual differences survey resulted in a final sample of 322 individuals. Within this sample, 45.6% were Male and 53.2% were female. The mean age was 37.51 (*SD* = 11.19). Racial composition for the sample was as follows: 75.5% White, 7.8% Black, 3.4% Hispanic, 10.5% Asian, 2.0% Mixed Race, 0.3% Native American, 0.3% other.

The study involved three major components: (a) a screening survey, (b) assessment of individual differences, and (c) a daily diary approach to examine interruptions, job performance, and affect over a 10-day period. The initial screening survey was posted as a HIT on Mturk. This survey served as a way to ensure the participants were working full-time and this question on full time status was surrounded by several unrelated questions to hide the purpose of the study. Participants who qualified (working on average 32 hours per week or more) were invited to a second HIT where they completed measures of polychronicity, CP, task-switching ability, and demographics. Upon completion of these measures, the participants were then invited to the 10 daily surveys which were emailed to them at 4PM CST, Monday through Friday for 2 weeks. The daily surveys gathered data on self-reported experiences of internal and external interruptions, self-reported job performance, and affective well-being. Due to dropout, two full waves of this procedure were conducted in order to reach the desired sample size. To encourage more participation, bonuses were given to participants for completing eight or more of the daily surveys.

Measures

Polychronicity was measured with the 14-item multitasking personality inventory (Poposki & Oswald, 2010; see Appendix A). Sample items include "I like to finish one task completely before focusing on anything else" and "I do not like having to switch my attention between multiple tasks". Polychronicity was assessed using a 5-point scale ranging from 1 (strongly disagree) to 5 (strongly agree). The scale was highly reliable (a = .93).

Contingency Planning to my knowledge does not have a validated scale. However, this study adapted items from Parke et al.'s (2018) daily diary study that assessed CP as a strategy to buffer the negative effects of interruptions. Sample items include: "I think through possible interruptions or disruptions and plan for them", "I develop alternative courses of action in case my tasks are interrupted or disrupted" and "I make my plans flexible to cover any unforeseen events." CP was be measured on a 7-point scale ranging from 1 (not at all) to 7 (to a very great extent). The scale had good reliability (a = .86).

Task-switching ability was be measured using a local-global task based on Navon's (1977) framework for assessing task switching and multitasking ability. This measure assessed the switching cost associated with task switching. Similar to the local-global task used by Miyake et al. (2000, p. 62-63), this task will consist of 16 practice trials along with three blocks of 32-trials totaling 96 trials with an equal amount of switch and non-switch trials. The trials consist of blue or black colored shapes. A blue shape signifies that the respondent should indicate the number of lines in the large shape (i.e., 1 for circle, 2 for X, 3 for triangle, 4 for square). A black shape signifies that the respondent should indicate the number of lines in the small shape (see Appendix B). A trial requiring the participant to respond to the

number of lines of a black or blue shape followed by a trial of the same color shape is a non-switch trial. Two consecutive trials consisting of black then blue or blue then black shapes would be considered a switch trial. The difference between the average response time for switch trials and the average response time for non-switch trials was computed and this represents task-switching ability.

Cognitive Ability was measured with a reduced 5-item ICAR validated by Kirkegaard and Bjerrekær (2016). The 5-item version was optimized for correlation with the 16-item ICAR. Sample items include "What number is one fifth of one fourth of one ninth of 900?" and "In the following alphanumeric series, what letter comes next? V Q M J H." The scale had low reliability (a = .58).

Daily Interruptions were measured with 2-item measures (see Appendix A). Similar to the study by Werner et al. (2012) and Puranik et al. (2019), interruptions were classified into internally and externally caused. There were no previously validated measures of internal or external interruptions that fit the needs of this study. Thus, items directly stemming from the definitions were used. Internal interruptions was measured by the items "I caused myself to switch from my primary tasks to another task, or something non-work related today" and "I willingly switched from working on my main goal to something else today". External interruptions was measured with the items "Something outside of my control caused me to switch from my primary tasks to another task, or something non-work related today" and "Something outside of my control caused me to switch from working on my main goal to something else today". These items were measured on a scale of 0 (never) to 5 (a great deal). The reliability for the internal scale was relatively low (a = .66), but the reliability for the external scale was good (a = .82).

Job Performance was measured using an adapted 7-item self-report measure of job performance that assesses performance daily (Williams & Anderson, 1991). The prompt given asked the participants to answer the items about themselves from the perspective of the supervisor (see Schoorman & Mayer, 2008). Sample items include "You have adequately completed assigned duties" and "You have failed to perform essential duties" (R). The 7-item scale had excellent reliability (a = .91). This scale correlated moderately with OCBI (r = .52) and OCBO (r = .55) scales, providing evidence for discriminant validity. This scale was measured on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) and had acceptable reliability (a = .76).

Affective Well-Being was measured using the 10-adjective short PANAS representing both positive and negative affect (Mackinnon, 1999). Reliabilities for the PA scale (a = .78) and the NA scale (a =.87) have been found to be acceptable. The list of the adjectives was given and the participants rated them on how they are currently feeling on a 5-point scale ranging from 1 (very slightly or not at all) to 5 (extremely). Reliability was acceptable for the PA scale (a =.76) and was good for the NA scale (a = .80).

Chapter 3

Results

Descriptive Statistics

Means, standard deviations, and correlations can be found in *Table 1*. As shown, internal interruptions were negatively associated with job performance (r = -.25, p < .001). In addition, external interruptions were found to be negatively related with job performance (r = -.26, p <.001). This gives some support for the notion that both types of interruptions contribute to poorer daily job performance. In addition, internal interruptions were found to be positively associated with negative affect (r = .24 p < .001) and also positively related to positive affect (r = .08, p = .014). External interruptions were positively associated with negative affect (r = .27, p < .001) but were not related to positive affect (r = .04, p = .22). This suggests some relationships with well-being, but the findings are more mixed. Cronbach's alpha for the measures are reported in *Table 1*along the diagonal.

Hypothesis Testing

Due to the nested nature of the study (days nested within participants), a two-level multilevel analysis was conducted to test the hypotheses. A multilevel analysis was appropriate as a substantial percentage of variability was within person for the focal daily variables (see Table 2*Table 1*). Polychronicity, contingent planning (CP), and task-switching ability were at the person level (Level 2). Internal and external interruptions, job performance, and affective well-being were at the day level (Level 1). Level 1 predictors were centered on the respective person mean. A summary for all hypothesis tests can be found in Table 3. Multilevel regression

output with JP as the outcome can be found in Table *4*, PA as the outcome in Table 5, and NA as the outcome in Table 6.

Hypothesis 1a stated that internal interruptions will be negatively related to performance. As shown in Table 3, the coefficient for the main effect was significant for daily internal interruptions (γ = -.07, *SE* = .02, *t* = -2.66, *CI* [-.11, -.02]), providing support for Hypothesis 1a. Hypothesis 1b stated that external interruptions will be negatively related to performance. The coefficient for the main effect was significant for daily external interruptions (γ = -.05, *SE* = .02, *t* = -2.81, *CI* [-.09, -.02]), providing support for Hypothesis 1b. Hypothesis 2a stated that internal interruptions will be negatively related to affective well-being. Two separate models were run to individually assess positive and negative affect. The coefficient for the main effect was not significant for PA (γ = .03, *SE* = .03, *t* = 1.16, *CI* [-.02, .09]); however, the coefficient for the main effect was significant for NA (γ = .09, *SE* = .02, *t* = 3.94, *CI* [.04, .12]), providing partial support for H2a. Hypothesis 2b stated that external interruptions will be negatively related to affective well-being. Similarly, two separate models were run to individually assess positive and negative affect. The coefficient for the main effect was not significant for PA (γ = 0.00, *SE* = .02, *t* = -.18, *CI* [-.05, .04]); however, the coefficient for the main effect was significant for NA as the outcome (γ = .08, *SE* = .02, *t* = 4.36, *CI* [.05, .12]), providing partial support for Hypothesis 2b. Hypothesis 3a stated that polychronicity will be positively related to internal interruptions. The coefficient for the main effect was not significant (γ = .11, *SE* = .06, *t* = 1.93, *CI* [-.00, .22]), failing to provide support for Hypothesis 3a. Hypothesis 3b stated that polychronicity will be positively related to external interruptions. The coefficient for the main effect was not significant (γ = .08, *SE* = .07, *t* = 1.23, *CI* [-.05, .21]), failing to provide support for Hypothesis 3b.

Hypothesis 4a stated that polychronicity will moderate the negative relationship between internal interruptions and performance such that when polychronicity is high, the relationship is weakened. The coefficient for the interaction term between polychronicity and internal interruptions was not significant (γ = .03, *SE* = .03, *t* = .93, *CI* [-.03, .08]), failing to provide support for Hypothesis 4a. Hypothesis 4b stated that polychronicity will moderate the negative relationship between external interruptions and performance such that when polychronicity is high, the relationship is weakened. The coefficient for the interaction between polychronicity and external interruptions was not significant (γ = .03, *SE* = .02, *t* = 1.19, *CI* [-.02, .07]), failing to provide support for Hypothesis 4b. Hypothesis 5a stated that polychronicity will moderate the negative relationship between internal interruptions and affective well-being, such that when polychronicity is high, the relationship is weakened. The coefficient for the interaction between polychronicity and internal interruptions with PA as the outcome was not significant (γ = .02, *SE* = .03, *t* = .66, *CI* [-.04, .09]); this was also not significant for NA as the outcome (γ = -.01, *SE* = .02, *t* = -.63, *CI* [-.06, .02]), failing to provide support for Hypothesis 5a. Hypothesis 5b stated that polychronicity will moderate the negative relationship between external interruptions and affective well-being, such that when polychronicity is high, the relationship is weakened. The coefficient for the interaction between polychronicity and external interruptions with PA as the outcome was not significant(γ = 0.00, *SE* = .03, *t* = .12, *CI* [-.05, .06]); this was also not significant with NA as the outcome (γ = -.02, *SE* = .02, *t* = -1.06, *CI* [-.06, .02]), failing to provide support for Hypothesis 5b.

Hypothesis 6a stated that contingent planning (CP) will moderate the negative relationship between internal interruptions and performance such that when CP is high, the relationship is weakened. The coefficient for the interaction between CP and internal interruptions was not significant (γ = .03, *SE* = .02, *t* = 1.61 *CI* [-.01,

.07]), failing to provide support for Hypothesis 6a. Hypothesis 6b stated that CP will moderate the negative relationship between external interruptions and performance such that when CP is high, the relationship is weakened. The coefficient for the interaction between CP and external interruptions was not significant (γ = .03, *SE* = .01, *t* = 1.89 *CI* [-.00, .06]), failing to provide support for Hypothesis 6b. Hypothesis 7a stated that CP will moderate the negative relationship between internal interruptions and affective well-being, such that when CP is high, the relationship is weakened. The coefficient for the interaction between CP and internal interruptions with PA as the outcome was not significant (γ = .03 *SE* = .02, *t* = 1.50, *CI* [-.01, .08]); this was also not significant with NA as the outcome (γ = .01, *SE* = .02, *t* = .44, *CI* [-.02, .04]), failing to provide support for Hypothesis 7a. Hypothesis 7b stated that CP will moderate the negative relationship between external interruptions and affective well-being, such that when CP is high, the relationship is weakened. The coefficient for the interaction between CP and external interruptions with PA as the outcome was not significant (γ = .03 *SE* = .02, *t* = 1.62, *CI* [-.01, .06]); this was also not significant with NA as the outcome (γ = .01, *SE* = .01, *t* = .83, *CI* [-.02, .04]), failing to provide support for Hypothesis 7b.

Hypothesis 8a stated that task-switching ability will moderate the negative relationship between internal interruptions and performance, such that when task-switching ability is high, the relationship is weakened. The coefficient for the interaction between task-switching ability and internal interruptions was not significant (γ = .01, *SE* = .04, *t* = .32, *CI* [-.07, .09]), failing to provide support for Hypothesis 8a. Hypothesis 8b stated that task-switching ability will moderate the negative relationship between external interruptions and performance, such that when task-switching ability is high, the relationship is weakened. The coefficient for the interaction between task-switching ability and external interruptions was

not significant (γ = -.01, *SE* = .03, *t* = -.31, *CI* [-.07, .06]), failing to provide support for Hypothesis 8b. Hypothesis 9a stated that task-switching ability will moderate the negative relationship between internal interruptions and affective well-being, such that when task-switching ability is high, the relationship is weakened. The coefficient for the interaction between task-switching ability and internal interruptions with PA as the outcome was not significant (γ = -.02 *SE* = .05, *t* = -.35, *CI* [-.11, .08]); this was also not significant with NA as the outcome (γ = .02, *SE* = .02, *t* = -.84, *CI* [-.07, .02]), failing to provide support for Hypothesis 9a. Finally, Hypothesis 9b stated that task-switching ability will moderate the negative relationship between external interruptions and affective well-being, such that when task-switching ability is high, the relationship is weakened. The coefficient for the interaction between task-switching ability and external interruptions with PA as the outcome was not significant (γ = -.07 *SE* = .04, *t* = -1.75, *CI* [-.15, .01]); this was also not significant with NA as the outcome (γ = 0, *SE* = .02, *t* = -.18, *CI* [-.05, .04]), failing to provide support for Hypothesis 9b.

Comparing Internal and External Interruptions

Research Question 1 asked whether internal or external interruptions have a significantly stronger negative relationship with performance and/or affective well-being. Two-level multilevel modeling results revealed that both internal and external interruptions were significantly negatively related to job performance (see Appendix C). A test was conducted to examine whether the coefficient for internal interruptions was significantly different from that for external interruptions. Results indicated there was not a significant difference (X^2 = .02, *p* = .89). Two-level multilevel modeling results revealed that both internal and external interruptions were significantly positively related to NA (see Table 3). A test was conducted to examine whether the coefficient for internal interruptions was significantly

different from that for external interruptions. Results indicated there was not a significant difference ($X^2 = .01$, $p = .92$).

Additional Analyses

In an attempt to further advance knowledge surrounding interruptions, several exploratory analyses were conducted. In addition to the Level 2 variables hypothesized in this study, it was thought that there could be other influences on both interruption frequency and resistance. Therefore, personality, cognitive ability, task-switch characteristics, and switch type were examined. For example, one's personality traits could have some influence in both interruptions experienced and the resistance to them. In addition, cognitive ability may relate to interruptions. It was also thought that whether the switches were from work to work or work to non-work tasks or whether the tasks were perceived as beneficial could influence both the job performance and affect associated with these interruptions. Data on these variables were collected in order to facilitate exploratory analyses related to these ideas.

In addition to the focal measures, the current study also included the measures of conscientiousness, neuroticism, and task-switch characteristics for exploratory analyses. For conscientiousness and neuroticism, additional analyses were conducted in order to test if there were significant main effects or interactions for the industriousness and orderliness aspects of conscientiousness or the volatility and withdrawal aspects of neuroticism. A test was run to assess if industriousness was significantly related to internal interruptions. The coefficient for the main effect was significant ($\gamma = -.22$, $SE = .07$, $t = -3.18$, CI [-.35, -.08]), indicating higher industriousness was associated with less frequent internal interruptions. A test was run to assess if orderliness was significantly related to internal

interruptions. The coefficient for the main effect was not significant (γ = -.04, *SE* = .10, *t* = - .52, *CI* [-.24, .14]). A test was run to assess if volatility was significantly related to internal interruptions. The coefficient for the main effect was significant (γ = .23, *SE* = .06, *t* = 3.69, *CI* [.11, .35]), indicating higher volatility was associated with more frequent internal interruptions. A test was run to assess if withdrawal was significantly related to internal interruptions. The coefficient for the main effect was significant (γ = .19, *SE* = .06, *t* = 3.15, *CI* [.07, .31]), indicating higher withdrawal was associated with more frequent internal interruptions.

A test was run to assess if industriousness was significantly related to external interruptions. The coefficient for the main effect was significant (γ = -.25, *SE* = .08, *t* = -3.19, *CI* [-.41, -.10]), indicating higher industriousness was associated with less frequent external interruptions. A test was run to assess if orderliness was significantly related to external interruptions. The coefficient for the main effect was not significant (γ = -.05, *SE* = .11, *t* = -.44, *CI* [-.26, .17]). A test was run to assess if volatility was significantly related to external interruptions. The coefficient for the main effect was significant (γ = .34, *SE* = .07, *t* = 4.98, *CI* [.21, .48]), indicating higher volatility was associated with more frequent external interruptions. A test was run to assess if withdrawal was significantly related to external interruptions. The coefficient for the main effect was significant (γ = .24, *SE* = .07, *t* = 3.46, *CI* [.10, .37]), indicating that higher withdrawal was associated with more frequent external interruptions.

An exploratory analysis was conducted to assess whether industriousness moderates the relationship between the Level 1 variables. The coefficient for the interaction between industriousness and internal interruptions with job performance as the outcome was not significant (γ = .06, *SE* = .03, *t* = 1.96, *CI* [0.00, .13]) The

coefficient for the interaction between orderliness and external interruptions with job performance as the outcome was not significant (γ = .01, *SE* = .03, *t* = .48, *CI* [-.04, .07]. The coefficient for the interaction between industriousness and internal interruptions with PA as the outcome was not significant (γ = .03, *SE* = .04, *t* = .79, *CI* [-.05, .11]); however, it was significant with NA as the outcome (γ = -.07, *SE* = .03, *t* = -2.54, *CI* [-.13, -.02]), with the pattern indicating that the relationship between internal interruptions and NA is weakened when there are higher levels of industriousness. The coefficient for the interaction between industriousness and external interruptions with PA as the outcome was not significant (γ = -.05, *SE* = .04, *t* = -1.33, *CI* [-.12, .02]); this was also not significant with NA as the outcome (γ = -.05, *SE* = .03, *t* = -1.93, *CI* [-.11, .00]).

An exploratory analysis was conducted to assess whether orderliness moderates the relationship between the Level 1 variables. The coefficient for the interaction between orderliness and internal interruptions with job performance as the outcome was not significant (γ = -.07, *SE* = .04, *t* = -1.56, *CI* [-.15, .02]) The coefficient for the interaction between orderliness and external interruptions with job performance was not significant (γ = -.02, *SE* = .03, *t* = -.70, *CI* [-.09, .04]. The coefficient for the interaction between orderliness and internal interruptions with PA as the outcome was not significant (γ = -.02, *SE* = .05, *t* = -.42, *CI* [-.13, .08]); this was also not significant with NA as the outcome (γ = -.03, *SE* = .04, *t* = -.82, *CI* [-.11, .04]). The coefficient for the interaction between orderliness and external interruptions with PA as the outcome was not significant (γ = -.05, *SE* = .04, *t* = -1.19, *CI* [-.13, .03]); this was also not significant with NA as the outcome (γ = -.02, *SE* = .02, *t* = -1.06, *CI* [-.06, .02]).

An exploratory analysis was conducted to assess whether volatility moderates the relationship between the Level 1 variables. The coefficient for the interaction between volatility and internal interruptions with job performance as the outcome was not significant (γ = 0.00, *SE* = .03, *t* = -.10, *CI* [-.06 .06]) The coefficient for the interaction between volatility and external interruptions with job performance as the outcome was not significant (γ = -.01, *SE* = .02, *t* = -.36, *CI* [-.06, .04]. The coefficient for the interaction between volatility and internal interruptions with PA as the outcome was not significant (γ = .02, *SE* = .04, *t* = .51, *CI* [-.05, .09]); this was also not significant with NA as the outcome (γ = .03, *SE* = .03, *t* = 1.09, *CI* [-.02, .08]). The coefficient for the interaction between volatility and external interruptions with PA as the outcome was significant (γ = .06, *SE* = .03, *t* = 1.99, *CI* [.00, .12]), with the pattern indicating that for higher levels of volatility, the negative relationship between external interruptions and PA is strengthened; however, this was not significant with NA as the outcome (γ = .02, *SE* = .02, *t* = .71, *CI* [-.03, .06]).

An exploratory analysis was conducted to assess whether withdrawal moderates the relationship between the Level 1 variables. The coefficient for the interaction between withdrawal and internal interruptions with job performance as the outcome was not significant (γ = -.01, *SE* = .03, *t* = -.52, *CI* [-.07 .04]). The coefficient for the interaction between withdrawal and external interruptions with job performance as the outcome was not significant (γ = .01, *SE* = .02, *t* = .36, *CI* [-.04, .05]. The coefficient for the interaction between withdrawal and internal interruptions with PA as the outcome was not significant (γ = .01, *SE* = .04, *t* = .20, *CI* [-.06, .07]); however, it was significant with NA as the outcome (γ = .06, *SE* = .02, *t* = 2.38, *CI* [.01, .11]), with the pattern indicating that for higher levels of withdrawal the positive relationship between internal interruptions and NA was strengthened. The coefficient for the interaction between withdrawal and external interruptions with

PA as the outcome was significant (γ = .08, *SE* = .03, *t* = 2.79, *CI* [.02, .14]), with the pattern indicating that for higher levels of withdrawal, the negative relationship between external interruptions and PA is strengthened; this was also significant with NA as the outcome (γ = .06, *SE* = .02, *t* = 2.69, *CI* [.02, .11]), with the pattern indicating that for higher levels of withdrawal, the negative relationship between external interruptions and NA is strengthened.

An exploratory analysis was conducted to assess whether cognitive ability moderates the relationship between the Level 1 variables. The coefficient for the interaction between cognitive ability and internal interruptions with job performance as the outcome was not significant (γ = -.02, *SE* = .02, *t* = -1.20, *CI* [-.06 .01]). The coefficient for the interaction between cognitive ability and external interruptions with job performance as the outcome was not significant (γ = -.01, *SE* = .01, *t* = -.76, *CI* [-.04, .02]. The coefficient for the interaction between cognitive ability and internal interruptions with PA as the outcome was not significant (γ = -.02, *SE* = .02, *t* = -.96, *CI* [-.06, .02]); this was also not significant with NA as the outcome (γ = -.02, *SE* = .02, *t* = -1.00, *CI* [-.05, .02]). The coefficient for the interaction between cognitive ability and external interruptions with PA as the outcome was not significant (γ = -.03, *SE* = .02, *t* = -1.76, *CI* [-.07, .00]).; this was also not significant with NA as the outcome (γ = -.01, *SE* = .01, *t* = -.43, *CI* [-.03, .02]).

For task-switch characteristics, participants were asked what percentage of daily task-switches were seen as beneficial and the percent of switches that were between one work-related task and another work-related task or between a work-related task and a non-work-related task. Results indicated that 56.7% of all switches were perceived as beneficial. In addition, the percentage of switches reported as being

due to switching from one work-related task to another work-related task (*M* = 62.58%, *SD* = 29.23) was greater than work to non-work task-switches (*M* = 37.08%, *SD* = 30.07).

An exploratory analysis was conducted to assess if perceiving the task-switches as beneficial would moderate the relationship between the Level 1 variables. The coefficient for the interaction between the perception of beneficial switches and internal interruptions with job performance as the outcome was significant (γ = .06, *SE* = .02, *t* = 3.24, *CI* [.02, .10]), with the pattern indicating that the negative relationship between internal interruptions and job performance was weakened when the interruptions were perceived as being beneficial. The coefficient for the interaction between the perception of beneficial switches and external interruptions with job performance as the outcome was not significant (γ = .01, *SE* = .02, *t* = .48, *CI* [-.02, .04]. The coefficient for the interaction between the perception of beneficial switches and internal interruptions with PA as the outcome was not significant (γ = -.03, *SE* = .03, *t* = -.96, *CI* [-.08, .03]); this was also not significant with NA as the outcome (γ = -.01, *SE* = .02, *t* = -.63, *CI* [-.05, .03]). The coefficient for the interaction between the perception of beneficial switches and external interruptions with PA as the outcome was not significant (γ = 0.00, *SE* = .02, *t* = .19, *CI* [-.04, .05]),; this was also not significant with NA as the outcome (γ = -.02, *SE* = .02, *t* = -1.01, *CI* [-.05, .02]).

An exploratory analysis was conducted to assess if the switch type (work to work or work to non-work) would moderate the relationship between the Level 1 variables. The coefficient for the interaction between work to work switches and internal interruptions with job performance as the outcome was significant (γ = .05, *SE* = .02, *t* = 2.85, *CI* [.02, .09]), with the pattern indicating that the negative

relationship between internal interruptions and job performance was weakened when the switches were from work-related tasks to other work-related tasks. The coefficient for the interaction between work to work switches and external interruptions with job performance as the outcome was not significant (γ = .02, *SE* = .02, *t* = 1.46, *CI* [-.01, .05]. The coefficient for the interaction between work to work switches and internal interruptions with PA as the outcome was not significant (γ = -.01, *SE* = .03, *t* = -.24, *CI* [-.06, .04]); this was also not significant with NA as the outcome (γ = -.02, *SE* = .02, *t* = -1.15, *CI* [-.06, .01]). The coefficient for the interaction between work to work switches and external interruptions with PA as the outcome was not significant (γ = .01, *SE* = .02, *t* = -.55, *CI* [-.06, .03]); however, this was significant with NA as the outcome (γ = -.02, *SE* = .02, *t* = -1.01, *CI* [-.07, -.01]), indicating that the positive relationship between external interruptions and NA was weakened when the switches were from work-related tasks to other work-related tasks.

The coefficient for the interaction between work to non-work switches and internal interruptions with job performance as the outcome was significant (γ = -.05, *SE* = .02, *t* = -2.91, *CI* [-.09, -.02]), with the pattern indicating that the negative relationship between internal interruptions and job performance was strengthened when the switches were from work-related tasks to non-work-related tasks. The coefficient for the interaction between work to non-work switches and external interruptions with job performance as the outcome was significant (γ = -.03, *SE* = .02, *t* = -2.06, *CI* [-.06, -.00], indicating that the negative relationship between external interruptions and job performance was strengthened when the switches were from work-related tasks to non-work-related tasks. The coefficient for the interaction between work to non-work switches and internal interruptions with PA as the outcome was not significant (γ = .01, *SE* = .03, *t* = .53, *CI* [-.04, .07]); however, this was significant with NA as the outcome (γ = .04, *SE* = .02, *t* = 2.25,

CI [.01, .08]), indicating that the positive relationship between internal interruption and NA was strengthened when the switches were from work-related tasks to non-work-related tasks. The coefficient for the interaction between work to non-work switches and external interruptions with PA as the outcome was not significant (γ = .03, *SE* = .02, *t* = 1.18, *CI* [-.02, .07]); however, this was significant with NA as the outcome (γ = .04, *SE* = .02, *t* = 2.53, *CI* [.01, .07]), indicating that that the positive relationship between external interruptions and NA was strengthened when the switches were from work-related tasks to non-work-related tasks

Chapter 4

Discussion

Interruptions are prevalent in the workplace and can have negative consequences for individuals and organizations. The advancement of technology and integration of new communication tools in the workplace and at home only furthers the amount of interactions and interruptions that can occur. In order to further understand interruptions and their consequences, the current research first separated interruptions into internally or externally caused, allowing us to assess their effects independently on job performance and affective well-being. If one interruption type was more disruptive than the other, then we could focus our research and practical efforts on reducing that type. However, this would only partially solve the problem, as interruptions will likely always occur (Galluch et al., 2015). Therefore, exploring traits, skills, and abilities that may influence interruption-related outcomes is also important. The current research also examined this, focusing on polychronicity, contingent planning, and task-switching ability.

Findings

Results provided partial support for the hypotheses. Findings indicated that internal interruptions were related to job performance and affective well-being (NA). Similarly, external interruptions were related to both job performance and affective well-being (NA). In contrast, both types of interruptions were not related to positive affect. In addition, polychronicity, contingent planning, and task-switching ability were not found to significantly moderate any of the relationships between the Level 1 variables.

Exploratory analyses also revealed some interesting findings. For instance, industriousness was found to be negatively related to internal and external interruptions. In addition, higher levels of industriousness weakened the positive relationship between internal interruptions and NA. Therefore, high industriousness individuals experienced fewer internal interruptions and were more resistant to them affectively. Volatility was found to be positively related to internal and external interruptions. In addition, the negative relationship between external interruptions and PA was strengthened when volatility was higher. This shows that those high in volatility are not only more susceptible to interruptions, but they are also more affectively affected by external interruptions than those lower in volatility. Withdrawal was also found to be positively related to internal and external interruptions. In addition, withdrawal strengthened the positive relationship between internal interruptions and NA and also strengthened the positive relationship between external interruptions and NA. Withdrawal also strengthened the negative relationship between external interruptions and PA. Those high in withdrawal not only experience more internal and external interruptions but are also more impacted affectively than those low in withdrawal. These findings indicate that personality clearly has an influence in both frequency of interruptions and resistance to them affectively. Further research needs to be conducted to confirm these findings and the rest of the Big 5 traits should be explored. Furthermore, the negative relationship between internal interruptions and job performance was weakened when the interruptions were perceived as beneficial. This suggests that not all interruptions are harmful. This is also supported by the findings of switch type. For example, tasks switches that were from work-related tasks to other work-related tasks weakened the negative relationship between internal interruptions and job performance. In addition, the negative relationship between external interruptions and PA was weakened when switches were from one work-related task to another. On the other hand, when the

task-switches were from a work-related tasks to non-work-related tasks, the negative relationships between internal and external interruptions and job performance were strengthened. In addition, this switch type strengthened the positive relationship between internal interruptions and NA. When the switch type was from work-related tasks to non-work-related tasks, the negative relationship between external interruptions and PA was strengthened. Finally, no significant effects were found with cognitive ability as a moderator. However, the 5-item ICAR measure had poor reliability, so the relationship between cognitive ability and interruptions should continue to be explored. In addition, further research should explore in more detail instances in which interruptions can be beneficial and examine ways to reduce the frequency of harmful interruptions. Discovering traits that are beneficial or harmful for resisting interruptions would also be useful in helping employees to be more aware of the negatives of interruptions and assist them in developing alternative strategies to fight them if necessary.

Theoretical Contributions

This study adds to previous literature by confirming that both internal and external interruptions are negatively related to job performance and affective well-being. Previous frameworks of interruptions (Jett & George, 2003) made it difficult to separate interruptions into those caused by internal versus external factors. In addition, the current study focused on interruptions involving task switching, an issue that has not been consistently addressed in previous work. For example, an email notification may appear on the employee's screen while they are working on a report, but they could choose to not open it until finishing their task. Refining the definition of interruptions to conceptualize them as when task-switching occurs can help to more clearly understand the effect of switching between tasks prior to completion.

The refined definition of interruptions and current results also appear to be consistent with interruption models. For instance, Couffe and Michael's (2017) DETOUR model suggests a path where, upon interruption, the individual switches tasks either with some warning or not. In the current study, participants rated the extent to which they experienced task-switches, which according to the DETOUR model should make primary task resumption more difficult, hindering task performance. Consistent with this, both internal and external interruptions were negatively related to performance, so regardless of interruption type the individual appears to go through the DETOUR stages. Similarly, these results also appear to be consistent with the memory for goals model (Altmann & Trafton, 2002). It may be that higher levels of interruptions can cause the ability to remember one's goals to weaken and thus hurt daily job performance. In addition, regardless of the preference for multitasking, affective well-being was still negatively associated with interruptions. This finding suggests that experiencing higher levels of task switching is stressful and/or could cause anxiety (Becker et al., 2013) regardless of one's desire to switch tasks. This could be due to perceptions of higher workload or negative feelings associated with incomplete tasks.

This study did not find support for polychronicity as a moderator of internal or external interruptions and job performance or affective well-being. For performance, it may be that, although polychronicity could be seen as a buffer to interruptions due to the employees preferring to multitask, they may not actually be better at managing them. Polychronicity may not have been found as a significant moderator with affective well-being as the outcome for similar reasons. It could be that the preference for multitasking reflects a preference in how to go about working on tasks for the day but in the end, most individuals are still negatively affected by interruptions. This study collected data on affect at the end of the workday, so participants high in polychronicity may prefer to switch tasks more,

but they may be as negatively affected by the switches as low polychronic individuals at the end of the day.

Support for contingent planning as a moderator was not found as well. It could be that those who plan for interruptions, although having a "Plan B", might still be negatively affected both affectively and performance-wise as those who did not plan. It could also be that once a certain level of internal interruption takes place, one is experiencing executive functioning failure. For example, if one is switching tasks to something work or non-work-related frequently that day, they may not have the self-regulatory resources left to navigate this successfully and affect and performance could suffer.

Task-switching ability was also not found to be a significant moderator. The task that measured task-switching ability in this study was rapid and involved multiple task-switches between two tasks. Although this could be useful at assessing the ability to switch at a micro level, switching between two tasks during the workday could take minutes or even hours. Therefore, this task may not accurately capture the ability to encode primary components of the main task and then resume the task successfully after a significant amount of time has passed. Long term task-switching ability should be further explored to see if this ability can reduce the negative effect interruptions have.

Finally, internal and external interruptions were found to be positively related to NA, but not negatively related to PA. Interruptions when taken at face value are inherently seen as negative. Higher levels of interruptions may increase stress and make these negative emotions more salient. However, PA as

operationalized in this study (inspired, alert, excited, enthusiastic, and determined) may just simply be unrelated to interruptions.

Practical Contributions

Although task-switching is seemingly inevitable, higher levels can be detrimental to performance and affective well-being. The current results also indicate that this holds for both internal and external interruptions. Thus, workers and employers should attempt to reduce both types of interruptions. For instance, for internal interruptions, employers could train employees on time management strategies or the consequences of interruptions (Long & Stanley, 2012). Even an awareness of interruptions and the difficulties that come with them could start behavioral change in how employees manage their workload. In addition, for external interruptions the organization could have a bigger role. Employers can educate employees on interruptions and their effects and find ways to reduce the costs associated with them (Sykes, 2011). In addition, they could educate employees on proper management of communication. Although collaboration is good, unnecessary or excess communication can be harmful.

Limitations

There were several limitations in this study that should be noted and addressed in future studies. One issue is that the surveys were distributed towards the end of the workday and participants were asked to recall interruptions across the day. Asking the participants to reflect back on their entire workday may cause some inaccuracies in perceived interruptions versus actual interruptions. In addition, it may have been easier for the participant to perceive one type of interruption over another or it could be difficult to realize a rapid switch between tasks was an interruption.

Another limitation of this study was the nature of the economy and job market during recruitment and data collection. Of the initial sample, 21% said they lost their job due to Covid-19 and 34.5% had their hours reduced. This could raise issues in two ways. First, this study required the participants to be working full-time (minimum of 32 hours a week average). This could have influenced the type of sample obtained (e.g., limiting participants to those in occupations that still have employees working full time). Second, some jobs may have changed drastically due to Covid-19. For example, many individuals were working from home. From the final sample, the percentage of time working from home was considerable (M = 61.9, SD = 41.1). In addition, the majority of the sample did not have many years of prior experience working from home (M = 2.35, Med = 0, SD = 4.73). This type of change may have implications for the amount of interruptions experienced, the nature of interruptions experienced, the nature of job performance, and the sources of stress affecting affective well-being.

Finally, the current study involved self-report measures for all Level 1 and Level 2 variables with the exception of the computerized task-switching ability task. This suggests common-method bias could be an issue; however, the daily diary methodology may help reduce concerns regarding this issue to some degree.

Future Research

Future research should continue to focus on both internal and external interruptions. Furthering knowledge on when and how interruptions arise can help to reduce the frequency of interruptions. However, some task-switches can be beneficial (Jett & George, 2003). Thus, research should continue to examine both internal and external interruptions to assess whether one has perceived benefits over another and in what situations either type could be more detrimental.

As noted, this study used self-report measures; future research might build on this by taking different approaches. Using different sources of data (like supervisor ratings of job performance), for instance, could help add to the understanding of the effect of interruptions on job performance. Furthermore, different experimental methodologies could provide additional sources of information and potentially more precise count information. Observational studies could help count the number of external interruptions as well as visible internal interruptions. Eye tracking or other computer tracking programs could measure time off task, frequency of interruptions, and amount of switches between different windows or tabs. Finally, lab studies could be useful in seeing how an experimenter interrupting a participant (external interruption) could affect their task performance and affect in a more controlled environment that could allow performance to be compared between and within participants objectively.

In addition, more solution-based approaches to limiting the frequency of interruptions need to be examined. Although limiting the frequency of interruptions can be helpful, there has not been much success (Galluch et al., 2015); however, this could be due to focusing on reducing external interruptions and therefore ignoring internal interruptions. For internal interruptions, trainings could be implemented to give employees the tools to resist interruptions and therefore reduce task switching. For external interruptions, studies could investigate more organizational or managerial solutions to reduce unnecessary interruptions by having time in the day where emails, notifications, and other potential interruptions are muted. Additionally, discovering what makes individuals better at the encoding stage of the DETOUR model (Couffe & Michael, 2017) may shed light on how individuals could be less negatively affected by task-switching.

Task-switching will likely always exist in the workplace (Galluch et al., 2015). Therefore, finding employees who will be more resistant to switches is becoming increasingly important. Polychronicity should continue to be explored as a potential buffer. In addition, various personality traits may make employees more or less resistant to interruptions, so this could be further explored. Finally, different work styles and work strategies like contingent planning could be explored further to determine if these help boost resistance to interruptions.

Conclusion

In this study, we investigated the effect of interruptions on job performance and affective-well-being. Interruptions were conceptualized as being synonymous with task-switching and were separated into internal versus external. The findings revealed that internal and external interruptions have detrimental effects on job performance and affective well-being. These results are consistent with the literature on interruptions and multitasking and suggest that workers and employers should consider ways to reduce both types of interruptions.

References

Adler, R. F., & Benbunan-Fich, R. (2013). Self-interruptions in discretionary multitasking. *Computers in Human Behavior*, *29*(4), 1441-1449.

Altmann, E. M., & Trafton, J. G. (2002). Memory for goals: An activation-based model. *Cognitive science*, *26*(1), 39-83.

Baethge, A., & Rigotti, T. (2013). Interruptions to workflow: Their relationship with irritation and satisfaction with performance, and the mediating roles of time pressure and mental demands. *Work & Stress*, *27*(1), 43-63.

Baethge, A., Rigotti, T., & Roe, R. A. (2015). Just more of the same, or different? An integrative theoretical framework for the study of cumulative interruptions at work. *European Journal of Work and Organizational Psychology*, *24*(2), 308-323.

Becker, M. W., Alzahabi, R., & Hopwood, C. J. (2013). Media multitasking is associated with symptoms of depression and social anxiety. *CyberPsychology, Behavior & Social Networking*, *16*, 132–135. doi:10.1089/cyber.2012.0291

Berinsky, A. J., Margolis, M. F., & Sances, M. W. (2014). Separating the shirkers from the workers? Making sure respondents pay attention on self-administered surveys. *American Journal of Political Science*, *58*(3), 739-753.

Coker, B. L. (2011). Freedom to surf: the positive effects of workplace Internet leisure browsing. *New Technology, Work and Employment*, *26*(3), 238-247.

Conard, M., Barbour, M., & Marsh, R. (2017). College Student Work Habits, Interruptions, and Stress. *i-Manager's Journal on Educational Psychology*, *10*(4), 1.

Couffe, C., & Michael, G. A. (2017). Failures due to interruptions or distractions: a review and a new framework. *American journal of psychology*, *130*(2), 163-181.

Daniels, K. (2000). Measures of five aspects of affective well-being at work. *Human Relations*, *53*(2), 275-294.

Diener, E., & Larsen, R. J. (1993). The experience of emotional well-being. In M. Lewis & J. M. Haviland (Eds.), *Handbook of emotions* (p. 405–415). Guilford Press.

Duckworth, A. L., Gendler, T. S., & Gross, J. J. (2016). Situational strategies for self-control. *Perspectives on Psychological Science*, *11*(1), 35-55.

Fletcher, K. A., Potter, S. M., & Telford, B. N. (2018). Stress outcomes of four types of perceived interruptions. *Human factors*, *60*(2), 222-235.

Galluch, P. S., Grover, V., & Thatcher, J. B. (2015). Interrupting the workplace: Examining stressors in an information technology context. *Journal of the Association for Information Systems*, *16*(1), 2.

Goldberg, L. R. (1999). A broad-bandwidth, public domain, personality inventory measuring the lower-level facets of several five-factor models. In I. Mervielde, I. Deary, F. De Fruyt, & F. Ostendorf (Eds.), *Personality Psychology in Europe*, Vol. 7 (pp. 7-28). Tilburg, The Netherlands: Tilburg University Press.

Hauser, D. J., & Schwarz, N. (2016). Attentive Turkers: MTurk participants perform better on online attention checks than do subject pool participants. *Behavior research methods*, *48*(1), 400-407.

Jett, Q. R., & George, J. M. (2003). Work interrupted: A closer look at the role of interruptions in organizational life. *Academy of management Review*, *28*(3), 494-507.

Kanfer, R., & Ackerman, P. L. (1989). Motivation and cognitive abilities: An integrative/aptitude-treatment interaction approach to skill acquisition. *Journal of applied psychology*, *74*(4), 657.

Keller, A. C., Meier, L. L., Elfering, A., & Semmer, N. K. (2019). Please wait until I am done! Longitudinal effects of work interruptions on employee well-being. *Work & Stress*, 1-20.

Kirchberg, D. M., Roe, R. A., & Van Eerde, W. (2015). Polychronicity and multitasking: a diary study at work. *Human Performance*, *28*(2), 112-136.

Kirkegaard, E. O., & Bjerrekær, J. D. (2016). ICAR5: design and validation of a 5-item public domain cognitive ability test. *Open Differential Psychology*, *1*.

Kristof, A. L. (1996). Person-organization fit: An integrative review of its conceptualizations, measurement, and implications. Personnel Psychology, 49, 1–49.

Labonté, K., Tremblay, S., & Vachon, F. (2019). Forewarning interruptions in dynamic settings: Can prevention bolster recovery?. *Journal of experimental psychology. Applied*.

Long, J. H., & Stanley, J. D. (2012). Managing interruption in the accounting workplace. *The CPA Journal*, *82*(5), 60.

Mackinnon, A., Jorm, A. F., Christensen, H., Korten, A. E., Jacomb, P. A., & Rodgers, B. (1999). A short form of the Positive and Negative Affect Schedule: Evaluation of factorial validity and invariance across demographic variables in a community sample. *Personality and Individual differences*, *27*(3), 405-416.

Mark, G., Gonzalez, V. M., & Harris, J. 2005. No task left behind? Examining the nature of fragmented work. *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*: 321-330. New York: ACM.

Mathieu, J. E., Aguinis, H., Culpepper, S. A., & Chen, G. (2012). Understanding and estimating the power to detect cross-level interaction effects in multilevel modeling. *Journal of Applied Psychology*, *97*(5), 951.

McVay, J. C., & Kane, M. J. (2010). Does mind wandering reflect executive function or executive failure? Comment on Smallwood and Schooler (2006) and Watkins (2008).

Miyake, A., Friedman, N. P., Emerson, M. J., Witzki, A. H., Howerter, A., & Wager, T. D. (2000). The unity and diversity of executive functions and their contributions to complex "frontal lobe" tasks: A latent variable analysis. *Cognitive psychology*, *41*(1), 49-100.

Monsell, S. (2003). Task switching. *Trends in Cognitive Sciences*, *7*(3), 134–140. doi: 10.1016/s1364-6613(03)00028-7

Mumford, M. D., Schultz, R. A., & Van Doorn, J. R. (2001). Performance in planning: Processes, requirements, and errors. *Review of General Psychology*, *5*(3), 213-240.

Navon, D. (1977). Forest before trees: The precedence of global features in visual perception. *Cognitive psychology*, *9*(3), 353-383.

Onwezen, M. C., van Veldhoven, M. J. P. M., & Biron, M. (2014). The role of psychological flexibility in the demands–exhaustion–performance relationship. *European Journal of Work and Organizational Psychology*, *23*(2), 163-176.

Parke, M. R., Weinhardt, J. M., Brodsky, A., Tangirala, S., & DeVoe, S. E. (2018). When daily planning improves employee performance: The importance of planning type, engagement, and interruptions. *Journal of Applied Psychology*, *103*(3), 300.

PitneyBowes. (1998). Pitney Bowes study finds messaging creates greater stress at work. Retrieved from: http://www.exn.ca/stories/1998/05/20/58.asp.

Poposki, E. M., & Oswald, F. L. (2010). The multitasking preference inventory: Toward an improved measure of individual differences in polychronicity. *Human Performance*, *23*(3), 247-264.

Puranik, H., Koopman, J., & Vough, H. C. (2019). Pardon the interruption: An integrative review and future research agenda for research on work interruptions. *Journal of Management*, 0149206319887428.

Robinson, A. M., & Smallman, C. (2006). The contemporary British workplace: A safer and healthier place? *Work, Employment, and Society*, *20*, 87–107. doi:10.1177/0950017006061275

Rogers, A. P., & Barber, L. K. (2019). Workplace intrusions and employee strain: the interactive effects of extraversion and emotional stability . *Anxiety, Stress, & Coping*, *32*(3), 312-328.

Schoorman, F. D., & Mayer, R. C. (2008). The value of common perspectives in self-reported appraisals: You get what you ask for. *Organizational Research Methods*, *11*(1), 148-159.

Stocker, D., Keller, A. C., Meier, L. L., Elfering, A., Pfister, I. B., Jacobshagen, N., & Semmer, N. K. (2018). Appreciation by supervisors buffers the impact of work interruptions on well-being longitudinally. *International Journal of Stress Management*, *26*(4), 331.

Sykes, E. R. (2011). Interruptions in the workplace: A case study to reduce their effects. *International Journal of Information Management*, *31*(4), 385-394.

Turner, J. E., Husman, J., & Schallert, D. L. (2002). The importance of students' goals in their emotional experience of academic failure: Investigating the precursors and consequences of shame. *Educational Psychologist*, *37*(2), 79-89.

Werner, N. E., Nelson, E., Miller, W. D., & Boehm-Davis, D. A. (2012, September). Interruptions in the Real World: Examining the Role of Internal Versus External Interruptions in a Hospital Pharmacy. In *Proceedings of the Human Factors and Ergonomics Society Annual Meeting* (Vol. 56, No. 1, pp. 819-823). Sage CA: Los Angeles, CA: SAGE Publications.

Wheelock, A., Suliman, A., Wharton, R., Babu, E. D., Hull, L., Vincent, C., ... & Arora, S. (2015). The impact of operating room distractions on stress, workload, and teamwork. *Annals of surgery*, *261*(6), 1079-1084.

Williams, L. J., & Anderson, S. E. (1991). Job satisfaction and organizational commitment as predictors of organizational citizenship and in-role behaviors. *Journal of management*, *17*(3), 601-617.

Zide, J. S., Mills, M. J., Shahani-Denning, C., & Sweetapple, C. (2017). Work interruptions resiliency: toward an improved understanding of employee efficiency. *Journal of Organizational Effectiveness: People and Performance*, *4*(1), 39-58.

Zijlstra, F. R. H., Roe, R. A., Leonora, A. B., & Krediet, I. (1999). Temporal factors in mental work: Effects of interrupted activities. *Journal of Occupational and Organizational Psychology*, *72*, 163–185. doi:10.1348/096317999166581

Table 1

Means, Standard Deviations, and Correlations for All Variables

Variables	*M*	*SD*	1	2	3	4	5	6	7	8
1. Internal	2.99	.68	(.66)	.55**	-.29**	.01	.23**			
2. External	2.63	.81	.25**	(.82)	-.27**	.01	.24**			
3. Job Performance	4.11	.51	-.17**	-.13**	(.76)	.31**	-.32**			
4. Positive Affect	2.96	.94	.03	-.00	.24**	(.76)	-.02			
5. Negative Affect	1.47	.72	.15**	.16**	-.16**	.02	(.80)			
6. Poly	3.09	.95						(.93)	.24**	-.08**
7. CP	4.31	1.30							(.86)	-.17**
8. TSA	52.49	171.76								

Note: TSA = task-switching ability (in ms). Internal. = internal interruptions, External. = external interruptions, Poly = polychronicity, CP = contingent planning, Correlations below the diagonal are within-person correlations. Correlations above the diagonal are between-person correlations. Numbers along the diagonal are the reliabilities for the associated scale. *M* (*SD*) number of daily responses: Internal = 5.78 (4.94), External = 5.78 (4.94), JP = 5.75 (4.94), Positive Affect = 5.75 (4.94), Negative Affect = 5.75 (4.94) *$p < .05$, **$p < .01$.

Table 2

Variance Components for Null Models for Day-Level Variables

Variables	Day-Level Variance	Person-Level Variance	% Variability Within Person
Internal Interruptions	0.514	0.325	62.3
External Interruptions	0.696	0.435	61.5
Job Performance	0.132	0.236	35.9
Pos Affect	0.252	0.814	23.6
Neg Affect	0.254	0.769	24.8

Table 3

Multilevel Modeling for Job Performance and Affective Well-Being

Hypoth	*t*	γ	*SE*	*CI*	*IV*	*Moderator*	*DV*
H1a	-2.66	-.07	.02	(-.11, -.02)	Internal		JP
H1b	-2.81	-.05	.02	(-.09, -.02)	External		JP
H2a	1.16	.03	.03	(-.02, .09)	Internal		PA
H2a	3.94	.09	.02	(.04, .12)	Internal		NA
H2b	-.18	0	.02	(-.05, .04)	External		PA
H2b	4.36	.08	.02	(.05, .12)	External		NA
H3a	1.93	.11	.06	(-.00, .22)	Poly		Internal
H3b	1.23	.08	.07	(-.05, .21)	Poly		External
H4a	.93	.03	.03	(-.03, .08)	Internal	Poly	JP
H4b	1.19	.03	.02	(-.02, .07)	External	Poly	JP
H5a	.66	.02	.03	(-.04, .09)	Internal	Poly	PA
H5a	-.63	-.01	.02	(-.06, .03)	Internal	Poly	NA
H5b	.12	0	.03	(-.05, .06)	External	Poly	PA
H5b	-1.06	-.02	.02	(-.06, .02)	External	Poly	NA
H6a	1.61	.03	.02	(-.01, .07)	Internal	CP	JP
H6b	1.89	.03	.01	(-.00, .06)	External	CP	JP
H7a	1.50	.03	.02	(-.01, .08)	Internal	CP	PA
H7a	.44	.01	.02	(-.02, .04)	Internal	CP	NA
H7b	1.62	.03	.02	(-.01, .06)	External	CP	PA
H7b	.83	.01	.01	(-.02, .04)	External	CP	NA
H8a	.32	.01	.04	(-.07, .09)	Internal	TSA	JP
H8b	-.31	-.01	.03	(-.07, .06)	External	TSA	JP
H9a	-.35	-.02	.05	(-.11, .08)	Internal	TSA	PA
H9a	-.84	-.02	.02	(-.07, .02)	Internal	TSA	NA

H9b	-1.75	-.07	.04	(-.15, .01)	External	TSA	PA
H9b	-.18	0	.02	(-.05, .04)	External	TSA	NA

Note: Hypoth = Hypotheses, PA = Positive Affect, NA = Negative Affect. Internal = internal interruptions, External = external interruptions, JP = job performance, Poly = polychronicity, CP = contingent planning, TSA = task-switching ability

Table 4

Multilevel Regression Estimates with JP as the outcome

Variable	Step 1: Null Model		Step 2: Internal and External		Step 3: Level 2 Main Effects		Step 4: Level 2 Interactions	
	γ	*SE*	γ	*SE*	γ	*SE*	γ	*SE*
Intercept (γ_{00})	4.15*	.04	4.15*	.04	3.67*	.26	3.62	.27
Random Effects								
Level 1 variables								
Internal (γ_{10})			-.05*	.02	-.09	.04	-.32	.16
External (γ_{20})			-.05*	.02	.00	.03	-.03	.13
Fixed Effects								
Level 2 variables								
Poly (γ_{01})					.02	.07	.03	.07
CP (γ_{02})					.11*	.05	.12*	.05
TSA (γ_{03})					.06	.06	.07	.07

Poly x Internal							.04	.05
Poly x External							.00	.04
CP x Internal							.03	.03
CP x External							.01	.02
TSA x Internal							.03	.04
TSA x External							-.02	.03
Residual (σ^2)	.13		.10		.13 (.16)		.13	
Intercept (τ_{00})	.24		.24		.27 (.26)		.27	

Note: * *CI* does not contain 0. Internal = internal interruptions, External = external interruptions, Poly = polychronicity, CP = contingent planning, TSA = Task-switching ability

Table 5

Multilevel Regression Estimates with affective well-being (PA) as the outcome

Variable	Step 1: Null Model		Step 2: Internal and External		Step 3: Level 2 Main Effects		Step 4: Level 2 Interactions	
	γ	*SE*	γ	*SE*	γ	*SE*	γ	*SE*
Intercept (γ_{00})	2.95*	.07	2.95*	.07	1.30*	.43	1.30*	.44
Random Effects								
Level 1 variables								
Internal (γ_{10})			.04	.03	.00	.05	-.27	.16

		-.01	.02	.01	.04	.20	.15
External (γ_{20})							
Fixed Effects							
Level 2 variables							
Poly (γ_{01})				.24*	.12	.24*	.12
CP (γ_{02})				.25*	.08	.25*	.08
TSA (γ_{03})				-.11	.11	-.08	.11
Poly x Internal						.08	.05
Poly x External						-.07	.05
CP x Internal						.01	.03
CP x External						.00	.03
TSA x Internal						.03	.04
TSA x External						-.09	.04
Residual (σ^2)	.25		.23		.23		.22
Intercept (τ_{00})	.81		.82		.73		.73

Note: * *CI* does not contain 0. Internal = internal interruptions, External = external interruptions, Poly = polychronicity, CP = contingent planning, TSA = Task-switching ability

Table 6

Multilevel Regression Estimates with affective well-being (NA) as the outcome

Variable	Step 1: Null Model		Step 2: Internal and External		Step 3: Level 2 Main Effects		Step 4: Level 2 Interactions	
	γ	*SE*	γ	*SE*	γ	*SE*	γ	*SE*
Intercept (γ_{00})	1.47*	.05	1.47*	.05	1.70*	.34	1.91*	.35
Random Effects								
Level 1 variables								
			.06*	.02	.03	.03	.28*	.08
Internal (γ_{10})								
			.07*	.02	.03	.02	.18*	.08
External (γ_{20}) Fixed Effects								
Level 2 variables								
Poly (γ_{01})					.02	.09	-.02	.09
CP (γ_{02})					-.09	.06	-.12	.07
TSA (γ_{03})					-.12	.08	-.13	.09
Poly x Internal							-.05	.03
Poly x External							-.03	.03
CP x Internal							-.03	.02
CP x External							-.01	.02
TSA x Internal							-.04	.02
TSA x External							.00	.02
Residual (σ^2)	.15		.13		.08		.09	

Intercept (τ_{00})	.45	.46	.47	.47

Note: * *CI* does not contain 0. Internal = internal interruptions, External = external interruptions, Poly = polychronicity, CP = contingent planning, TSA = Task-switching ability.

Appendix A

Measures

Daily Interruptions

Internal	*External*
1. I caused myself to switch from my primary tasks to another task, or something non-work related today	1. Something outside of my control caused me to switch from my primary tasks to another task, or something non-work related today
2. I willingly switched from working on my main goal to something else today	2. Something outside of my control caused me to switch from working on my main goal to something else today

Job performance – (Williams and Anderson, 1991)

For these next questions, please answer from the perspective of your immediate supervisor or boss. Over the past XXX period of time at your job, please indicate how well you have performed each of these behaviors.

1. You have adequately completed assigned duties.
2. You have neglected aspects of the job you are obligated to perform.
3. You have fulfilled responsibilities specified in job description.
4. You have performed tasks that are expected of you

5. You have met formal performance requirements of the job.

6. You have failed to perform essential duties.

7. You have engaged in activities that will directly affect your performance evaluation

PANAS – Mackinnon et al. (1999)

Positive affect (PA Factor)	*Negative affect (NA Factor)*
Inspired, Alert, Excited, Enthusiastic, Determined	Afraid, Upset, Nervous, Scared, Distressed

Polychronicity – Poposki & Oswald, 2010

1. I prefer to work on several projects in a day, rather than completing one project and then switching to another. (.77)

2. I would like to work in a job where I was constantly shifting from one task to another, like a receptionist or an air traffic controller. (.39)

3. I lose interest in what I am doing if I have to focus on the same task for long periods of time, without thinking about or doing something else. (.41)

4. When doing a number of assignments, I like to switch back and forth between them rather than do one at a time. (.73)

5. I like to finish one task completely before focusing on anything else. (R) (.77)

6. It makes me uncomfortable when I am not able to finish one task completely before focusing on another task. (R) (.60)

7. I am much more engaged in what I am doing if I am able to switch between several different tasks. (.64)

8. I do not like having to shift my attention between multiple tasks. (R) (.68)

9. I would rather switch back and forth between several projects than concentrate my efforts on just one. (.81)

10. I would prefer to work in an environment where I can finish one task before starting the next. (R) (.58)

11. I don't like when I have to stop in the middle of a task to work on something else. (R) (.62)

12. When I have a task to complete, I like to break it up by switching to other tasks intermittently. (.74)

13. I have a "one-track" mind. (R) (.52)

14. I prefer not to be interrupted when working on a task. (R) (.41)

Note. Items followed by (R) are reverse-scored. Numbers in parentheses following each item represent corrected item-total correlations.

Contingent Planning

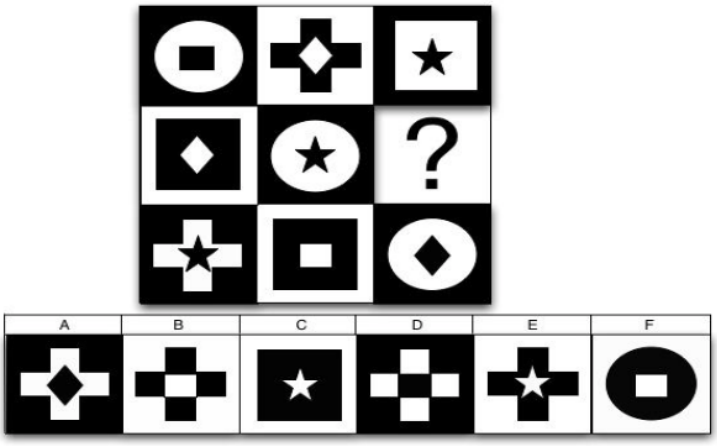
1. I think through possible interruptions or disruptions and plan for them

2. I develop alternative courses of action in case my tasks are interrupted or disrupted

3. I make my plans flexible to cover any unforeseen events

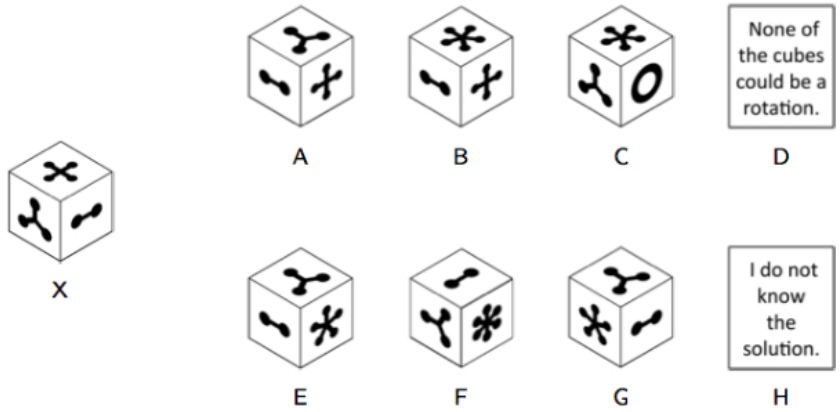
Cognitive Ability

1. What number is one fifth of one fourth of one ninth of 900?
2. In the following alphanumeric series, what letter comes next? V Q M J H
3. In the following alphanumeric series, what letter comes next? Q S N P L
4.



5.

All the cubes below have a different image on each side.
Select the choice that represents a rotation of the cube labeled X.



Demographics

1. What is your gender?

2. What is your age?

3. Which of the following best describes your race/ethnicity?

   a. White

   b. Black

   c. Hispanic/Latino

   d. Asian

   e. Middle-Eastern

   f. Mixed race

   g. Pacific Islander

   h. Native American

i. Other

4. Is English your native language?

   a. Yes

   b. No

5. What is the highest degree or level of school you have completed?

   a. Less than high school degree

   b. High school graduate (high school diploma or equivalent including GED)

   c. Some college but no degree

   d. Associate degree in college (2-year)

   e. Bachelor's degree in college (4-year)

   f. Master's degree

   g. Professional degree (e.g., MD, DDS)

   h. Doctoral degree

   i. Other

6. If you selected other, what degree or level of school have you completed?

_____

Appendix B

Images