Interruptions in the Goal Striving Process

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Abstract

Interruptions in the Goal Striving Process

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The modern workplace is a fast-paced environment where there are many opportunities to be interrupted during the workday. Interruptions lead to postponing work on the interrupted task, influence goal abandonment, and can lead to the experience of negative emotions such as anger, resentment and stress. Few researchers have examined workplace interruptions and their impact on the productivity and well being of the affected employees. This paper will discuss the theory and existing research that applies to interruptions, introduce testable hypotheses, and discuss three empirical studies conducted to test the theoretical model.

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DEDICATION

To W.E.S., Addie and Cal

Chapter I: Literature Review and Theory

INTRODUCTION

This dissertation is about individual goal striving and the processes involved in this activity. Goals and theories that utilize goal constructs have become the major focus of motivation researchers. Successfully setting and reaching goals is a proscription for success. While much of this work has emphasized the choice of goals and the setting of goals, recent work has focused more on the processes involved when one is actually working towards the goals, the setbacks, unexpected surprises, the intrusions of other things to do and the ever present interruptions that can facilitate or hinder goal attainment.

While several theories have been used to help explain the impact of interruptions on behavior and performance (e.g., Information overload, Milford & Perry, 1977; Distraction/Conflict theory, see Baron, 1986), the underlying issue is one of being interrupted while attending to work tasks. As our tasks at work often include specific goals, goal striving is the main stream of theory and research by which our understanding of the interruptions sequence is informed.

In addition, while group and team efforts are increasing in the workplace, people still must have time to complete their individual portions of the whole. Perlow (1999) showed that even when working as a group, group members often interrupt and disrupt the goal striving of one another. As such, my focus is on individuals being interrupted during goal striving.

The plan of this paper is to briefly discuss the broad perspective of goal striving and then focus in on a specific approach that concentrates on how people allocate their time and effort across tasks as they try to reach their goals. Using the constructs from this approach, I will examine the role of interruptions, what they are and how they impact this goal striving process. Although individual differences are definitely expected to influence how individuals react to interruptions, I am only interested in studying variables that may be controllable by the employee or the organization. People's ability to multi-task or their level of extraversion may be good predictors of success in handling interruptions, however, I would prefer to look at influences that currently exist regardless of the employees' personality characteristics.

MOTIVATION BACKGROUND

Goals help us to focus our attention--hence they provide us direction for our behaviors. They also produce effort and persistence as well as particular strategies that allow us to work toward a specific goal (Mitchell & Daniels, 2003). Goals are seen as a basic driving force (Locke, 1994) for human behavior. Goals and their motivational properties have been extensively studied, and there are several ways in which goals are categorized (e.g., participatively set vs. self set deadlines or higher order vs. lower order, etc.), each with its own influence on motivation (see for a review, Mitchell & Daniels, 2003).

Goal Striving

Locke and Latham's (1990) theory of Goal Setting has been most influential in organizational behavior motivation and goal research. Goal setting leads us up to what we *want* to do but has little to say about how such motivation is translated into action. Research on goals has moved from focusing on only goal setting, or the antecedents to action, but also to include the actions involved in striving to attain the goal (Kanfer & Kanfer, 1991; Lord & Levy, 1994). This interest in goal striving, typically referred to by self-regulation theories, has exploded over the past 10 years, and it

now overwhelms goal setting research at a rate of approximately 2 to 1 (Diefendorff & Lord, 2006)

Goal striving, has been informed by three main contributors—self regulation, control theory, and action theory. Drawing from the principles of self-regulation, where people are seen as actively controlling their cognitive and emotional psychological processes for the purpose of attaining goals (Gollwitzer & Bargh, 1996; Diefendorff & Lord, 2000), Kanfer and her colleagues (Kanfer & Ackerman, 1989; Kanfer & Heggestad, 1997; Kanfer, 1996) focus on how people distribute the resource of attention as they progress through the learning curve and the influence that individual differences have in this process. Control Theory (Klein, 1989; Campion & Lord, 1982; Lord & Hanges, 1987; Lord & Levy, 1994) focuses on goal discrepancies. For example, the Test, Operate, Test and Exit (TOTE) unit described by Miller, Galanter and Pribram (1960), explains how behavior can change as one moves toward accomplishing a goal (Markham & Brendl, 2000) by comparing one's current progress with the goal over time. Thus, goal striving is a dynamic process that occurs over time (Klein, 1989). Research by Lord extends these ideas to investigate multiple tasks (Kernan & Lord, 1990) and the importance of

planning as a self-regulatory process that facilitates the successful response to discrepancies (Diefendorff & Lord, 2000). Finally, action theory (Kuhl, 1984; Frese & Zapf, 1994; Gollwitzer, 1996) views goals as having a preaction and an action phase. The preaction phase consists of setting the goal and developing a plan for attaining the goal. The action phase occurs when the person begins striving towards goal attainment. During the action phase, changes in thoughts and behaviors occur in response to striving to achieve the goal, as such, the plan can change as one receives feedback while working on the task.

While several phases have been proposed, most researchers agree to four phases, goal setting, planning, goal striving and goal attainment (Austin & Vancouver, 1996; Heckhausen, 1991; Vancouver & Day, 2005; Diefendorff & Lord, 2006; see Figure 1).

Pacing and Spacing

Pacing and spacing (Mitchell, Lee, T. W., Lee D. Y., & Harman, 2004; Mitchell, Harman, Lee, T. W., Lee, D. Y, 2006) focuses on the resources expended as one works with assigned deadline goals in a multiple goal context. Pacing and spacing involves common workplace goals, "Short term, lower level, specific task goals that are assigned and time related" (p. 4). In an effort to

reach these goals, workers create plans that describe which tasks they will work on and when during the day they plan on working towards each of their goals. Part of the plan includes decisions on spacing, or how resources such as effort and time will be expended across tasks. Pacing, or the allocation of resources such as time and effort to a single task (Kernan &Lord, 1990) is also estimated in the planning phase. Pacing decisions tend to be more frequent as the employee works on a task and gains feedback on how he or she is progressing towards task completion. This second phase of pacing and spacing is the action phase wherein the employee begins work, gains feedback, makes adjustments to the plan, and spaces and paces accordingly. During the action phase, spacing is called switching and refers to moving from one task to another such as when one task is completed, when an interruption breaks the flow of work on a task, or when a new, more urgent task interrupts an ongoing task.

During the action phase, performance feedback allows the employee to revisit the plan and make changes when necessary. This goal discrepancy awareness occurs when one compares his or her progress on a particular goal and the deadline for that goal, and it can impact pacing and spacing behaviors. People tend to be

aware of how much time they have left to work on a task that has a deadline (e.g., Waller, Conte, Gibson, & Carpenter, 2001), and if not on track, people can either be ahead with a positive goal discrepancy (PGD) or behind with a negative goal discrepancy (NGD), though they tend to be behind as people often underestimate the amount of time tasks will take to accomplish (Buehler, Griffin & Ross, 1994). An obvious event that can produce these NGDs is an interruption. Spacing and pacing sets the groundwork for understanding how individuals accomplish their daily task goals. It incorporates both goal setting (e.g., the plan) and goal striving. As such, the main premises of spacing and pacing have informed the theorizing and the empirical testing of interruptions in the following studies.

INTERRUPTIONS BACKGROUND

Interruptions Theory, first introduced by George Mandler in 1964, views interruptions as causing both visceral and emotional arousal. Interruptions in the process of goal attainment temporarily delay an organized sequence, which produces an immediate visceral response. The autonomic nervous system (ANS) becomes activated, and individuals then make cognitive interpretations of the interruption and surrounding context that determines the affective

response (Mandler, 1989). As with the two-factor theory of emotion (Schachter & Singer, 1962), the intensity of the emotion is dependent upon the visceral response and the cognitive evaluation of the situation by the interrupted person. The organized sequence is analogous to cognitive schemas, and is subject to change (via assimilation or accommodation) based on experience. Interruptions may become normal and thus a part of one's schema (Mandler, 1989) such as when the boss sticks her head in your office every day before 10AM to check on what you are doing.

Unlike theories of goal blocking or frustration, Interruptions Theory does not necessarily view all interruptions as resulting in negative emotions. It is the content and context of the interruption that leads to the eventual cognitive evaluation of sympathetic nervous system arousal. "Thus, interruption [*sic*] may lead to expressions of fear, anger, surprise, humor, euphoria, depending entirely upon factors other than the interruption itself" (Mandler, 1964, p. 174).

Interruptions in the Workplace

During one's workday, numerous interruptions can occur, and there has been relatively little research on the effects of interruptions in the workplace (Fisher, 1998; Jett & George, 2003;

Rogelberg, Desmond, Warr, & Burnfield, 2006; Zijlstra, Roe, Leonora, & Krediet, 1999). While some authors have concentrated on interruptions that stem from one's own internal thoughts (Antrobus, Singer, & Greenberg, 1996), this paper will focus on interruptions that come from external sources such as phone calls, email, instantaneous messages (that pop up on your computer screen while you are working), managers stopping by to assign additional work or to "check up" on progress, co-workers coming in for a chat or to ask for assistance, and various unexpected events like someone moving into the office next door. Interruptions have been defined as, "Incidents or occurrences that impede or delay organizational members as they attempt to make progress on work tasks" (Jett & George, 2003, p. 494), and they may not necessarily be benign pauses on the road to task completion. They can lead one to experience negative outcomes such as stress, overload and/or pressure (Kirmeyer, 1988); increased negative mood (Williams, Suls, Alliger, Learner & Wan, 1991); negative mood and distress (Williams & Alliger, 1994); and feelings of boredom (Damrad-Frye & Laird, 1989). In addition, the negative consequences of being interrupted can include delaying an ongoing work task (Jett & George, 2003; Mitchell, T. Lee, D.Y. Lee, &

Harman, 2004), forgetting intentions held in working memory (Einstein, McDaniel, Williford, Pagan, & Dismikes, 2003), instigating a crisis deadline for the interrupted task (Perlow, 1999), and disrupting the interrupted person's sense of "flow" (Jett & George,2003). Interruptions may also have positive consequences such as when an interruption results in the transfer of information that aids task completion, counteracts boredom, or allows the interrupted person to reevaluate the task at hand (Jett & George, 2003). When considering the different possible outcomes of interruptions, and the focus of this dissertation, perhaps it would be beneficial at this point to define interruptions as pauses in goal striving.

Scant research regarding the impact of interruptions on work performance and emotions exists, and much of the research focuses on different portions of the interruptions sequence. To date, there has been no systematic study of a theory of workplace interruptions, a problem this dissertation seeks to rectify. There do exist, however, a few studies that can provide some background. First, Eyrolle and Cellier (2000; Cellier & Eyrolle, 1992) found that interruptions increased subjects' time on the original task. That is, people took longer to complete a task (controlling for the time

devoted to the interruption) than people who were not interrupted. Zijlstra, Roe, Leonora, and Krediet (1999), on the other hand, in an experiment with governmental secretarial workers, found when interruptions contained new tasks to be completed immediately, when it was possible, subjects simply increased their effort (pace) on the original task and completed the task in the same amount of time as those with no interruptions. However, these researchers found that as the complexity (non-substitutability) of the new tasks increased, subjects' time to re-orient to the original task (labeled "change-over") and the time required in starting work on that original task and finding the point where he/she was working when the interruption happened (labeled resumption) became significantly longer. Foster (2004) found that working mothers received, on average 1.33 interruptions from their childcare provider each day. These interruptions significantly reduced work productivity, and the mothers reported experiencing lower levels of concentration following the interruptions. Speier, Valacich, and Vessey (1999) studied the impact of interruptions on decision making in a sample of undergraduate students. They found that interruptions improved decision-making on simple tasks and impaired decision-making on complex tasks with task dissimilarity

and interruption frequency increasing the effect for complex tasks. Rudolph and Repenning (2002), in their discussion of disasters, analyzed 2 case studies and performed a series of simulations. They found that when equating interruptions with stress, the Yerkes-Dodson law (1908), which argues that stress and performance are related in an inverse U-shape such that a moderate amount of stress is most beneficial for performance, applied. In both the case studies, the workers involved were able to deal with the increasing interruptions to a point (i.e., the tipping point) at which performance began to decline.

Recently, Jett & George (2003) outlined several different types of interruptions that can occur during the workday: intrusions, breaks, distractions, and discrepancies. Though all four types are definitely interruptions, intrusions are what most people would refer to as an interruption. They emanate from others and they temporarily block task completion. "An intrusion is an unexpected encounter initiated by another person that interrupts the flow and continuity of an individual's work and brings that work to a temporary halt" (p. 495). Intrusions are commonplace in organizations, and with the advent of multiple technological advances in telecommunications, the ways in which one can

experience an intrusion have increased (see Jett & George, 2003; Speier et al., 1999). Managers tend to intrude more on subordinates than the reverse (Perlow, 1999), but managers, too suffer from frequent intrusions during the workday (Grove, 1983; Speier et al., 1999). Though intrusions are considered to be disruptive, few studies have examined them to discern how this disruption could be alleviated (for an exception, see Perlow, 1999). Breaks are a second type of interruption that may temporarily block task completion. Breaks consist of coffee breaks and lunches, pre-determined times when a rest period will occur, and spontaneous pauses during work time such as when one part of a larger task is completed.

Distractions draw one's attention away from the task at hand by introducing incompatible stimuli. "Distractions are psychological reactions triggered by external stimuli or secondary activities that interrupt focused concentration on a primary task" (p.500). These distractions are typically unrelated to the interrupted task (e.g., coworkers arguing in the hall or a plane passing overhead), and they result in diverting cognitive energy away from the task at hand and toward the distracting stimuli. Finally, discrepancies interrupt more than simply the task on which one is working. Discrepancies

are inconsistencies between one's expectations and immediate observations that are relevant to the task at hand as well as to the person's well being. Jett and George argue that discrepancies as interruptions disrupt automatic processing such that one will lose their sense of "flow" or move from a state of mindlessness into a state of conscious cognitive processing. This approach to discrepancies is somewhat different from ours. I agree that discrepancies are disruptive, but I believe they begin after the interruption has occurred—when the person notices the discrepancy. For example, when an individual is working and experiencing flow, the catalyst that disrupts that flow could be an external source such as an intrusion or a distraction or an internal source like a fleeting thought about turning off the coffee maker at home. As such, I see discrepancies as resulting from an interruption—though capable of continuing the interruption if one ruminates about being behind.

I am most interested in external, uncontrollable interruptions as those are the types of interruptions that are most likely to be able to be mitigated by the organization. This paper specifically looks at intrusions and distractions as independent variables and

discrepancies as moderators of the relationship between the other interruptions and performance.

I now present our theory on interruptions during goal striving informed by pacing and spacing theory. The interruptions sequence is presented in chronological order. Much of the discussion lends itself to testable hypotheses. Only those hypotheses that were actually tested are included in the text.

HYPOTHESES

Before I begin, it is important to state the boundary conditions for this discussion. Similar to Spacing and Pacing, the goals of interest are lower-order goals rather than higher order goals (i.e., task goals vs. career goals). Our higher order goals can be interrupted repeatedly throughout our lives, and those interruptions may or may not have any impact on a person's work performance. Interruptions of higher order goals, while an interesting topic, are not within the scope of this paper. Also in line with Spacing and Pacing theory, I am interested in the effects of interruptions on the attainment of deadline goals. Unlike Spacing and Pacing, these goals may be either assigned or self-set. While assigned goals decreases the likelihood that a goal will be abandoned (due to evaluation apprehension), I believe that these

lower-order goals will also be difficult to abandon. Doing so would result in a collapse of the goal hierarchy to which these lower-order goals belong, and could, therefore, lead to much more than the abandonment of one, small goal.

It is assumed that the person has accepted these goals, and this acceptance manifests itself in the day's plan. If the person did not accept the goal, the goal would not be included in the plan, and they would not begin working on it. As stated previously, I am interested in interruptions that are unscheduled. Intrusions by family, friends, co-workers, and supervisors and distractions to which one wouldn't easily habituate all fall under the umbrella of unscheduled interruptions. It is the uncontrollable nature of these interruptions that I believe will have the greatest impact on task performance.

The model begins with the interruption of a task in progress (TIP; see Figure 1). As was mentioned above, Zijlstra (1999) and colleagues found, when holding the complexity of the interrupted task constant, that as the complexity of the new tasks increased, subjects' time to re-orient to the original task and the time required in starting work on that original task and finding the point where he/she was working when the interruption happened became

significantly longer. It is expected that the inverse should also be true--as the interrupted task increases in complexity, the time to completion should be significantly longer when holding the content of the interruption constant.

H1: Interrupted high complexity tasks will take longer to complete than low complexity tasks.

Interruptions theory (Mandler, 1964, 1989), Affective Events Theory (Weiss & Cropanzano, 1996), and the work on the role of affect in work motivation (George and Brief, 1996) all agree that the emotions resulting from interruptions (or events) can be disruptive and block, at least momentarily, goal attainment. According to Mandler, interruptions in the process of goal attainment for a TIP temporarily delay an organized sequence, which produces an immediate visceral response. The autonomic nervous system (ANS) becomes activated, and individuals then make cognitive interpretations of the interruption and surrounding context that determines the affective response (Mandler, 1989). Affective events theory adds to this by including both a primary and secondary appraisal processes (Weiss & Cropanzano, 1996) to the cognitive interpretation of the interruption. The primary appraisal deals with the interruption's goal relevance and congruence.

Resultant positive emotions are most likely when the interruption is an intrusion that results in new information that is beneficial to the TIP or when a distraction alleviates boredom on routine tasks (Jett & George, 2003). Negative effects of interruptions are more prevalent as not only the content of the interruption, but the interruption itself can be viewed as blocking progress toward goal attainment. Of course, an interruption could both relieve boredom and block progress. Thus, the first appraisal concerns whether the interruption is helpful (new information, relief), harmful (blocking progress) or both. From this judgment will flow emotional reactions. Either emotion, positive or negative can impede goal progress (George & Brief, 1996). Owing to the power of negative emotions (Taylor, 1991), it is expected that they will make it more difficult to return to work than positive emotions.

H2: Interruptions perceived as harmful will lead to more negative emotion experienced than will those perceived as helpful.

H3: Interruptions that induce negative emotion will result in longer time to complete the TIP than interruptions that induce neutral emotion.

The secondary appraisal is an evaluation of the interruption and the environment in which it occurs and what that means in relation to the individual being interrupted and his or her goal progress. Part of that appraisal process includes the person responsible for the interruption. The previous theory and research on interruptions has neglected the history of the people involved in the interruption. The cognitive appraisal process (CAP) may be influenced by the history of the people involved, especially if the interrupter behaves in a consistent manner. Should the interrupter be someone who consistently plays her music at a loud volume and distracts the employee, then the sound of the music or even the sight of the individual can elicit an immediate negative emotion.

H4: The interrupting person will elicit an immediate emotional reaction from the interrupted person.

It is expected that the pattern of the CAP (primary and secondary) and resultant experienced emotion will repeat itself several times during the interruption: first, during the commencement of the interruption; second, during the interruption; third, after the interruption in response to the interruption; and fourth, once the interrupted individual attempts to pace and space

and thus re-orient him or herself to the TIP in relation to all other tasks to be completed.

As an example, if the person intruding is someone who tends to be long-winded and while he or she requires a lot of your time, he or she doesn't add much to either your current tasks or benefit your emotional well being, the intrusion is expected to result in an immediate emotional reaction such as dread ("Oh, not *him.* He talks forever."), a secondary emotion during the interruption such as anger ("How long is he going to go on?"), another emotional reaction once the intrusion has ended such as relief ("Thank goodness, I can finally get back to work.") and potentially a fourth emotional reaction such as anxiety once you realize that the intrusion has put you behind in your work ("Oh, no! I'm really behind *now*."). If the person intruding is concise (or at least someone who will leave your office without hurt feelings if you tell them you are busy) and typically a positive person, then the immediate emotional reaction should be relatively positive ("It is always nice to see him.") as should be the emotion during the interruption ("He is trying to take up as little of my time as possible."), the emotion that occurs after the intrusion has ended would probably also be positive if your interaction during the

intrusion went well ("I'm glad he stopped by."), and the emotion that flows from the cognitive re-assessment of where you are on your task progress can be either positive or neutral (if you are ahead or still on track) or can change to negative if you realize that the intrusion has led you to be behind on your work--though it is not likely that this negative emotion will be as strong as the one from the previous example. Thus, there are at least three (if the interruption is quick, there might not be an emotion during the interruption), and most likely four opportunities for discrete emotions during an interruption. The first when the interruption begins, the second during the interruption, the third when the interruption ends, and the fourth occurs once the individual re-assesses his or her progress on the interrupted TIP. However, the first and the last CAPs and emotions should be the strongest. The first is expected to influence further reactions and the last should be a culmination of all the cognitions and emotions experienced during the interruptions process. As such, the model and discussion focus most closely on these two CAPs and emotions. In addition, these emotional reactions are expected to hold for both intrusions and distractions.

The workload context of the interruptions is expected to influence the initial CAP. As Speier and colleagues found (1999), the number of interruptions is important (more interruptions are more annoying than fewer interruptions). Additionally, owing to the cognitive complexity of switching between tasks (Zijlstra et al., 1999), the timing of the interruption (at the beginning of the task vs. closer to completion) should influence the CAP and emotions. And whether the interruption is related to work only or includes superfluous information should influence the person's interpretation and subsequent reaction.

H5a: Interruptions that occur closer to the completion of the TIP will result in more negative emotion than those that occur closer to the beginning of the TIP.

H5b: Interruptions that occur late in the TIP as opposed to earlier in the TIP will result in the interrupted person experiencing a NGD.

H6: Interruptions that include chat unrelated to work will result in more negative emotions than those that do not include unrelated chat.

The cognitive appraisal and initial emotions are expected to influence the content of the interruption. As in the prior example,

your long-winded interrupter may lead you to do whatever you can to move the interruption activity along so that you can get back to work within a reasonable amount of time. You might make up excuses for not being able to continue a conversation; you may not attend to what he or she is saying but instead concentrate on your TIP; you might even ask the person to leave your office. If the interrupter brings information that is helpful to the TIP, you might extend the interruption and engage in conversation as a part of your workload has been lessened. If you have had few interruptions that day, you might welcome your coworker's music played in the office space next to you as a nice mental break. Urgency of the TIP and other tasks is expected to influence the interrupting activity as well as serve as a moderator for the other influences. When urgency is low, the interrupting activity can be extended versus when urgency is high. Thus, the CAP and the emotions experienced should influence the tone and duration of the interrupting activity moderated by the urgency of the TIP and all other tasks. This, of course, assumes some control over the interruption by the interrupted person. Should he or she not have control over the interruption, there should be no influence by the interrupted person on the interrupting activity.

H7: An interruption perceived as helpful will result in the interruption lasting longer than those perceived as harmful.

H8: An interruption that results in negative emotions will lead the interrupted person to shorten the duration of the interruption.

Once the interrupting activity has ended, the interrupted person is expected to again go through a cognitive appraisal process and experience emotions. This should happen as the individual re-assesses the interruption and prepares to return to work via pacing and spacing. This time, the CAP is expected to be influenced by any goal discrepancies.

H9: The perception of an NGD will lead to more negative emotions than will a PGD or an "on track" estimation.

Intrusions that are similar to the task at hand are also less problematic in the effect they have on the interrupted person (Mandler, 1964). According to Miller, Galanter, and Pribram (1960), interruptions put a strain on the load one carries in working memory unless the interruption is of the same nature as the original task such that it follows a similar organized sequence. The organized

sequence has interchangeable parts. For example, when typing a letter, the organized sequence includes the data processor and printer, the grammatical rules for constructing a letter, and the actual typing. Being interrupted by a request for another letter requires that the interrupted person simply continue the same sequence with different words. This should be easily incorporated into the ongoing sequence of activities (Zijlstra et al., 1999).

Distractions, on the other hand, have been shown to be more problematic when similar to the task at hand (Milford & Perry, 1977; Baron, 1986). The distinction is in the ongoing task and the nature of the interruption. Intrusions require a pause in the TIP. When experiencing that type of interruption, the interrupted person stops working and attends to the intrusion. It is this pause in work that then requires the individual to reorient him or herself to the TIP once the interruption is complete. Distractions occur at the same time as the TIP. Only those distractions that become intrusions (e.g., stop work progress) should result in the same need to reorient once the distraction is complete.

H10: Controlling for the time devoted to the interruption, as interruptions and distractions are

introduced, there will be an increase in the time to complete the original task

H11: Controlling for the duration of the interruption, intrusions will result in significantly longer time to complete the original task than will distractions.

The length of the interruption is also expected to influence both emotions and pacing and spacing activity (e.g., a 2 minute interruption should be less problematic than a 30 minute one). The length of the interruption will also influence attributions for goal discrepancies, which in turn, will influence pacing and spacing activity. A large NGD can impact whether a person continues to strive toward goal attainment or abandons the goal (Blount & Janicek, 2001; Campion & Lord, 1982; Lord & Hanges, 1987). NGDs are expected to occur not only from underestimating the amount of time that has passed (Buehler et al., 1994) but also as the result of unplanned interruptions. In addition, interruptions may lead one to reassess the expected value of reaching a goal (Kanfer & Kanfer, 1991), to reassess one's progress toward task completion (Atkinson & Birch, 1970; Ford, 1992) and to experience negative affect as a result of falling behind (Mandler, 1964, 1989; Carver & Scheier, 1990). These assessments take time away from

all tasks, and the more often one reassesses his or her progress, the more likely it is that goal discrepancies on all tasks will become larger and more salient (Mitchell et al., 2004; 2006).

H12: The length of the interruption will influence TIP progress (NGD).

Positive goal discrepancies (PGD) are expected to lead to positive emotions. These are most likely when the interruption has included new information helpful to the TIP. PGDs also influence pacing and spacing activity as they may lead a person to complete a task early, and therefore, result in a need to revisit and rework the plan based on the newly available time.

H13: PGDs will result in a need to shuffle any remaining day's tasks.

The interpersonal interaction that occurs during the interruption is expected to also influence the post-interruption CAP and performance. If the interpersonal interaction is positive, it should lead to experienced positive emotions. Cognitive evaluations lead to affect, which includes both felt emotion and, more distally, moods. Emotions are instantaneous and directed at some causal agent or event (such as an interruption) whereas moods are more long-term, are influenced by situational factors

(such as repeated interruptions), but are not in response to any one cause (George & Brief, 1996; Weiss & Cropanzano, 1996). Emotions and moods have the ability to influence one's post-interruption performance in several ways. First, people must consciously turn their attention back to the original task once the interruption is over (Damrad-Frye & Laird, 1989; Speier et al., 1999), yet because dealing with emotions often takes precedence over other behaviors (Frijda, 1993), the interrupted person may not be able to immediately return his or her attention back to the original task, which uses up time, and, in turn, results in lower subsequent performance. Secondly, the felt emotions and moods, especially negative, may be incompatible with emotional requirements of one's job (as the expression of negative emotions is not typically tolerated in the workplace), and may hinder effective goal pursuing activities (George & Brief, 1996). Affect, therefore, is expected to mediate the relationship between the interruption and behavior, and impact subsequent performance.

H14: Negative emotions are expected to mediate the relationship between the interruption and performance.

CONCLUSION

In this chapter, I have discussed the process of goal striving and how it can become delayed or derailed due to uncontrolled and incompatible interruptions. Successful attainment of one's goals is indeed necessary for success. Understanding the intricacies of the interruption's sequence may be instrumental in understanding how to best mitigate any negative outcomes that may surface due to unexpected, external interruptions. It is this understanding that I turn to next in our discussion of the empirical findings.

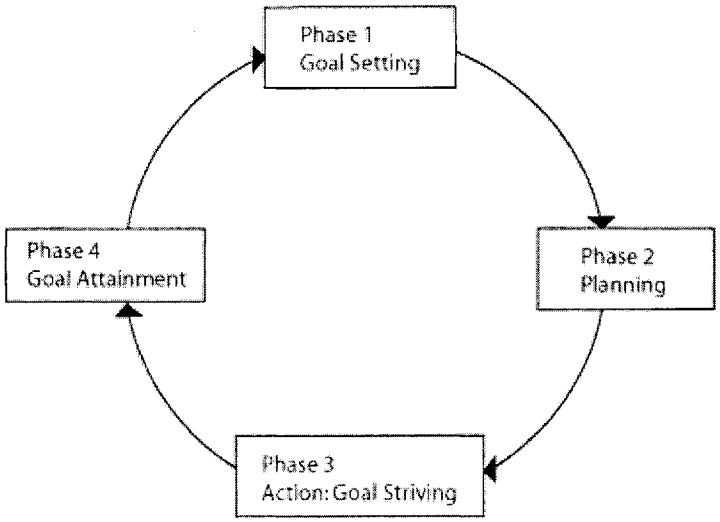


Figure 1: Self-regulation Phases

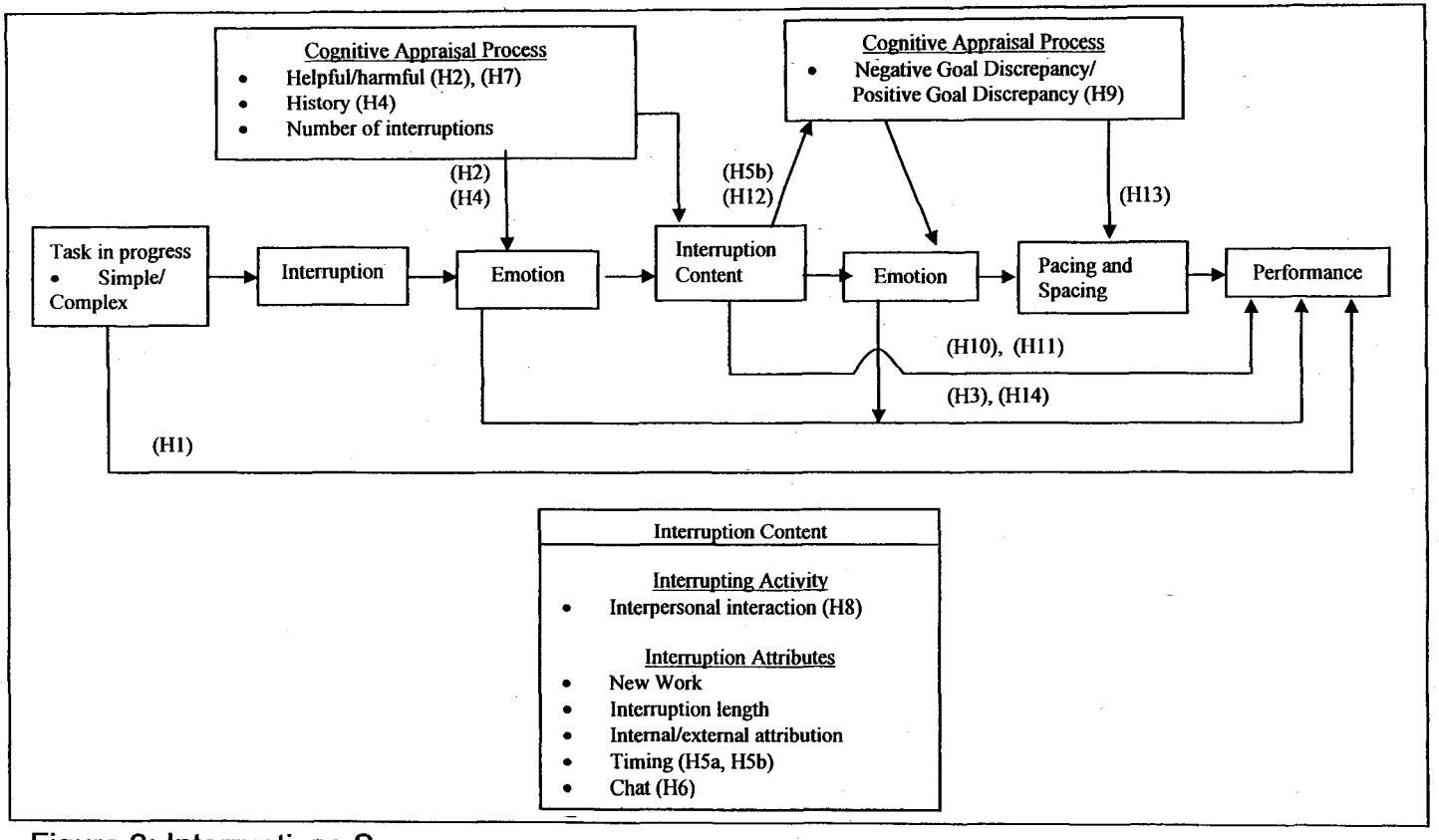


Figure 2: Interruptions Sequence

Chapter II: Study 1

The interruptions process is quite complex and the previous discussion suggests several areas for study. The model suggests more than I tested in this dissertation. The studies were divided into two approaches, the descriptive approach and the experimental approach. The descriptive approach was used to gain a more complete understanding of the interruptions sequence. Most of the model received a preliminary test using the descriptive approach. This enabled me to refine the model and allowed me to design effective manipulations to use in study 3 in the experimental approach phase. The experimental approach focused on interruption attributes.

Descriptive Approach

Although we experience them repeatedly and on a daily basis, we don't really know very much about interruptions. In an effort to gain some insight into the process, I used survey data to gather general information and also to begin preliminary tests of the hypotheses.

Method

Subjects

The subjects were undergraduate students enrolled in business classes at the University of Washington. As the target population is employees who experience multiple interruptions, this sample allowed me to survey individuals from several different industries. The subjects received partial course credit for participating. The survey was distributed every day at different times of the day for a 2-week period. The determining factor in survey distribution was available space in which I could conduct the survey. The available classrooms differed each day and at different times during the day.

Materials and procedure

The subjects answered surveys that included a combination of forced choice and open-ended questions. Subjects were asked to choose from a list the interruptions they receive at work, which happen most, which make it most difficult to return to work and which make them angry. They were also given the option of filling in any interruptions that were not included in the survey. Data was analyzed using descriptive statistics. A copy of the survey is included as Appendix A.

A total of 132 subjects answered the survey. Of those, only 2 had never held a job, and their surveys were not included in the analysis. The survey was distributed most often during the lunch hour and after 3:30 every day for 2 weeks, though there were two survey times that differed, one at 10:30AM on a Tuesday and again on a Thursday. The subjects' ages ranged from 18-45 years old with a mean age of 21.7. Women made up 52.6% of the subjects and their total working tenure ranged from 2 months to 20 years with a mean tenure of 4.67. 72 subjects indicated that they had no managerial experience, 22 indicated that they had experience as a manager and 36 did not indicate. Most of the subjects were from the United States (n=72) with the countries of Asia and the Pacific Rim with the second most subjects (n=18). Subjects indicated their races such that 61.7% indicated white, 35.1% indicated Asian, and 1.1% indicated African American. The rest did not indicate or wrote "other". The majority of the subjects were juniors of seniors (n=92).

Results

The subjects consistently indicated that emails, calls, and instant messages from friends and family happened most often, made it most difficult to return to work and made them angry. They also indicated that bosses, coworkers, and subordinates stopping by "for a

chat" made it difficult to return to work and made them angry. Even bosses assigning new work was not reported disruptive as often as the unrelated chat.

Subjects indicated that when they received telephone calls at work, they were most often from friends and family (68.4%). When they received instant messages at work, they were most often interrupted by friends (85.4%), and when they received emails at work, they were interrupted most often by friends (39.2%), but they also indicated that they were interrupted by family (15.2%), coworkers (14.4%), other colleagues (13.6%) and their bosses (12.%). Subjects also indicated that when interrupted by someone stopping by their office, their bosses interrupted them most often to chat (28.8%) and assign new work (28.8%). 22.4% of the subjects also indicated that their bosses interrupted them to discuss their progress on a task and 20% indicated that they were interrupted by their bosses asking them for help with a task. They indicated that coworkers interrupted them most often by stopping by for a chat (54.8%) and to ask for help with a task (26.2%). Of those with subordinates, 31.7% indicated that they were interrupted by their subordinates wanting to chat and 32% were interrupted by their subordinates asking for help with a task.

When asked which interruptions made it difficult to return to work, subjects indicated telephone calls (84.9%), instant messages (92.1%), and emails from friends and family (69.7%) most often. In response to people stopping by their office, subjects indicated that their bosses stopping for a chat (43%) and to assign new work (28%); their coworkers stopping by for a chat (47.9%), to ask for help with a personal problem (24%), and to ask for help with a task (21.9%); and their subordinates stopping by for a chat (47%) and for help with a personal problem (24.1%) made it most difficult for them to return to work after the interruption.

Interruptions external to the organization that made them most angry were telephone calls from friends and family (86.3%), instant messages from friends and family (88%), and emails from friends and family (88.5%). Internally, the boss (56.7%), their coworkers (60.6%), and their subordinates (50.5%) stopping by for a chat made them angriest whereas interruptions such as the boss assigning new work (4.1%) or coworkers (13.5%) and subordinates (6.6%) asking for help on a task were specified far less often.

Discussion

These findings suggest that non face-to-face interruptions from electronic sources such as emails and telephone calls typically come

from friends and family, these interruptions make it difficult to return to work and they make the interrupted people angry more often than interruptions from other sources, similar to what would be expected with work-family conflict, and providing tangential support for Hypothesis 4, which suggests that the person interrupting elicits an emotional reaction as soon as the person knows who is interrupting (see Figure 3). Face-to-face interruptions were most problematic when they consist of unrelated chat whether that chat comes from one's boss, coworkers or subordinates, providing some preliminary support for Hypothesis 6, which stated that interruptions that included chat unrelated to work would result in more negative emotions than those that did not include unrelated chat (see Figure 4).

Limitations and Conclusions

This study was a one-time survey, so no real causal analyses were possible. The survey was also retrospective in nature as the subjects were asked about their workplace interruptions overall rather than focusing on individual interruptions. The study was helpful in understanding that interruptions from home are perceived negatively as are interruptions that include chat unrelated to work. These two variables were included in the second study in an attempt to better understand their influence on emotions and productivity.

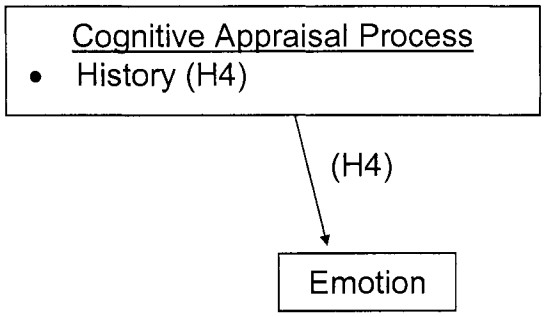


Figure 3: Hypothesis 3

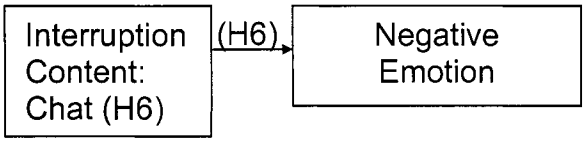


Figure 4: Hypothesis 4

Chapter III: Study 2

Study 1 relied on retrospective survey data. Study 2 provided more current data using event sampling methodology (ESM; Williams, Suls, Alliger, Learner, & Wan, 1991). Even though ESM is somewhat retrospective, event sampling is more accurate than typical retrospective surveys (Foster, 2004), and ESM can be used to test many of the hypotheses. ESM allows for subjects to answer survey questions in as little as a few moments after the incidents occur whereas the typical survey may rely on data that is months or even years old as was the case in study 1. In addition, hypotheses that do not lend themselves to lab study can be studied using ESM (Beal & Weiss, 2003). As the data collection occurred at a field site, I could only test as many hypotheses as the subjects' supervisors would allow. Issues deemed too risky to ask were questions around the history the subject has with the interrupter (though a proxy for this was possible--subjects were asked what their immediate reaction was to the person interrupting them) and job satisfaction questions. Also, the supervisors thought that the measures of trait affect (PANAS and Affect Intensity) were too long, and they were unwilling to allow me to include them in the surveys.

Several of the departments contacted for participation refused to allow access to their employees stating that they were concerned that asking questions about emotional reactions to being interrupted would induce negative affect when the employees were interrupted.

Hypotheses 2, 3, 4, 5a, 5b, 6, 7, 8, 9, 12, and 13 were tested in this study. Hypotheses 1, 3, 10, and 11 are tested in study 3. The main focus of the second study was to obtain field data relating to emotional reactions to being interrupted. One question regarding their NGD/PGD estimation was used as the operationalization of performance. The portions of the model tested in Study 2 are included in Figure 5.

The study investigated the actual interruptions experienced by 31 people working on their jobs. Event sampling methodology was used to collect the data (ESM; Williams, Suls, Alliger, Learner, & Wan, 1991). Even though ESM is somewhat retrospective, event sampling is more accurate than typical retrospective surveys in that there is less chance of confounding using ESM than there is in typical retrospective surveys (Beal & Weiss, 2003; Foster, 2004). In addition, ESM tends to produce data less linked to self-representation biases and more closely linked to experiences of

interest (Beal & Weiss, 2003). ESM is also very useful for gathering data in field settings (Beal & Weiss, 2003).

Event sampling, also known as Ecological Momentary Assessment (EMA, Beal & Weiss, 2003), uses three basic methods for collecting data: event contingent, signal contingent, and interval contingent. Event contingent data sampling relies on the event to occur before surveys are answered. Usually, the participant will fill out a questionnaire every time the event of interest occurs. Signal contingent data sampling relies on a signal to the participant that they should respond to some questions regarding the occurrence of interest. The participant is usually contacted via beeper or pre-programmed alarm at random times during the day, and following the signal, the participants answer the questionnaires. Interval-contingent relies on specific times during the day when the participant knows they will be signaled. The times are the same every day. Once they receive the signal, participants then fill in the questionnaires (for a more complete discussion of EMA, see Beal & Weiss, 2003).

To lessen the impact of the interruption of ESM on the participants' mood, emotions, and productivity, the participants were only contacted once a day for 10 days. While event-contingent and/or

signal-contingent sampling would have been more ideal, the confounding influence of the surveys becoming interruptions in and of themselves, led to the decision to only contact the participants once a day at the end of the workday. Once the data collection started, the participants received emails instructing them to access a web-based survey at the end of their workday for a 2-week period (1 time a day for 10 days total).

Method

Subjects

Subjects were 31 full time administrative employees from the University of Washington. These participants worked in offices that dealt both with internal university needs as well were responsible for interacting with the public. Only one of the subjects was male. Originally, 43 people agreed to participate in the survey, of those only 31 completed at least five days of surveys, leaving a 63% response rate. The completion rate of the 31 X 10 emails was 86%. Eleven of the 31 people completed all ten days.

Measures

Participants answered online surveys that included questions designed to ascertain their emotional reactions to being interrupted as well as their perceived performance following the interruption (see

Appendix B for the complete survey). Hypotheses 2, 3, 4, 5a, 5b, 6, 7, 8, 9, 13, and 14 were tested in this study. To control for daily mood, participants were first asked to rate their morning mood using the five-item FACES scale (Kunin, 1998). Prior to the beginning of data collection, the participants were instructed that an interruption was someone or something that caused them to stop working such as a phone call or someone stopping by their office. As a manipulation check, participants were then asked whether or not they were working on a specific task when interrupted. This question helped tease out those instances that were perceived to be interruptions, yet that were not occurrences where an actual task was interrupted. For analyses, I only included those instances where a task was interrupted.

Hypothesis 2 states that interruptions perceived as harmful will lead to more negative emotion than will those perceived as helpful. The participants were asked the degree to which the interruption was helpful or harmful (Likert-type scale 1 = Extremely harmful, 5 = Extremely helpful; reverse scored for analyses) to their progress on the interrupted task and their emotional reactions to the interruption (Likert-type scale 1 = Extremely happy, 5 = Extremely unhappy). Hypothesis 3 suggests that negative emotions as a result of the interruption will result in longer time to complete the task than positive

emotions. To test this hypothesis, the participants were asked what their emotion was as a result of the interruption (Likert-type scale 1 = Extremely happy, 5 = Extremely unhappy) and to what extent the interruption put them ahead or behind on their day's work tasks (Likert-type scale 1 = Very Behind, 5 = Very Ahead; reverse scored for analyses). Hypothesis 4 tests the idea that prior history with a person will influence the person's emotional reaction to being interrupted by that person. The participants were asked who interrupted them, a friend, a family member, their supervisor, their co-worker, or their subordinate. Participants were given the choice of "Other" where they filled in the position of the person interrupting them. The "Other" category was consistently answered with "customer," "supplier," or other worker (e.g., a manager from another department). For analysis purposes, I dichotomized this variable into work and non-work related interruptions of which the "other" was included as work related. Participants were asked how they felt the moment they saw or heard the voice of the person interrupting them. Hypotheses 5a and 5b suggest that where in the task (early vs. late) the person is interrupted will have an effect on their emotion and their goal progress. This was tested by asking them where in the task they were working (Likert-type scale 1 = Just started, 5 = Almost finished) when interrupted.

Hypothesis 6 flows from the findings of study 1 and suggests that chat unrelated to work will result in more negative affect. The participants were asked if the interruption included chat unrelated to work (yes or no), and if so, how they felt about the chat (Likert-type scale 1 = Extremely happy, 5 = Extremely unhappy). Hypothesis 7 states that an interruption perceived as helpful will result in the duration of the interruption lasting longer than an interruption perceived as harmful. They were asked if the interruption included information that was helpful or harmful to the TIP (Likert-type scale 1 = Extremely harmful, 5 = Extremely helpful; reverse coded), and how long in minutes the interruption lasted. To test hypothesis 8, an interruption that results in negative emotions will lead the interrupted person to shorten the duration of the interruption, was also tested using the question about how long the interruption lasted as well as how they felt about being interrupted (Likert-type scale 1 = Extremely happy, 5 = Extremely unhappy). Hypothesis 9 deals with NGD and PGD estimations such that an NGD will lead to more negative emotion than a PGD or "on track" estimation. Subjects were asked about their perceived progress on the task (Likert-type scale 1 = Very Behind, 5 = Very Ahead; reverse coded) and how they felt about their progress (Likert-type scale 1 = Extremely happy, 5 = Extremely unhappy). Hypothesis 12

suggests that the length of the interruption will influence TIP progress such that a longer interruption will lead to a NGD. This was tested using interruption length as the IV and task progress (Likert-type scale 1 = Very Behind, 5 = Very Ahead; reverse coded) as the DV. Hypothesis 13 follows up on the NGD/PGD question stating that PGDs will result in a greater need to shuffle one's remaining tasks for the day. This was also tested with a Likert-type scale with 1 = not at all and 5 = to great extent.

Procedure

Once a day for 10 days, the participants received a reminder email to access the online survey. Prior to data collection, each participant informed me of when would be the best time for them to receive the reminder email. They were asked to complete the survey with regard to the last interruption they had experienced that day.

The survey began by asking their overall mood that morning (for control purposes). Even though asking participants to recall their morning mood may influence their reported emotional reactions to the interruptions, controlling for morning mood resulted in more conservative testing of the dependent variables. Participants were then asked a series of questions regarding the interruption attributes described above and how they felt about being interrupted. The

participants answered the same survey at the same time daily for 10 days. At the end of the 10 days, the participants were thanked and the data collection ended.

Statistical Analysis

The data were stacked with each measurement occasion treated as a different person such that they represent the rows in the analysis. Independent, dependent, and N-1 dummy variables were arranged in the columns (Beal & Weiss, 2003). This creates a data file that can be analyzed using pooled within-person regression. This procedure partitioned explained variance in the daily responses into variance due to persons.

The first two steps of the hierarchical regression removed variance attributable to persons. At Step 1, subjects' daily mood scores were entered. Step 1 controlled for temporal or serial lag effects as any current mood state may be influenced by previous mood states (Caspi, Bolger, & Eckenrode, 1987). At Step 2, *N-1* dummy-coded vectors (which are used to uniquely identify subjects; Cohen & Cohen, 1983; Pedhauzer, 1982), were entered to remove variance in dependent measures attributable to subjects (Beal & Weiss, 2003; Williams et. al, 1991). At Step 3, the predictor variable was entered depending on the hypothesis being

tested. Lag variables were not entered into the equation because mood has not typically been found to have an influence beyond one day's experiences (Williams et. al, 1991). The general statistical model used for analyzing the data was: $DV = b_0 + (b_1 DM) + (b_3 S_3 + \ldots + b_{30} S_{30}) + (b_{31} IV) + e$

DM = Daily Mood, S = dummy-coded subject vector, IV = Independent variable for hypothesis being tested

Assumption Checks

All relationships were checked for violation of assumptions (please see Figures 6-35 for all plots). The correlations between the variables were checked for $r > .30$ as the cutoff for multicollinearity. Some of the DVs showed evidence of multicollinearity with the dummy variables. The stepwise regression corrected the problem with collinearity in that the dummy variables were entered prior to adding the IV, which removed the correlated variance prior to the final step in the regression.

Histograms with the normal curve were plotted for each hypothesis, and except for hypothesis 4, they all showed minor violations of normality. Normal probability plots exhibited linearity for all but two of the relationships (included in the hypotheses

results below). The scatterplots of the residuals for each hypothesis showed a systematic influence of error on the DV, violating Homogeneity of Variance. Durbin-Watson statistics for each hypothesis were between the accepted 1.5-2.5 levels, so the observations were not correlated over time. Except for hypothesis 7, the various scatterplots show the same pattern, and no transformation (e.g., square root, natural log, etc.) improved the pattern. As negative emotion increases, the error terms decrease suggesting that the bias becomes less important as negative emotion increases, providing a conservative test of the hypotheses.

Results

Table 1 presents the means, standard deviations and correlations for all study variables. Hypothesis 2 states that interruptions perceived as harmful will lead to more negative emotion than will those perceived as helpful. The hypothesis was supported ($\beta = .41$, $p < .001$). The more harmful the interruption was perceived to be, the higher the level of negative affect reported by the participant (see Table 2).

Hypothesis 3 suggests that negative emotions as a result of the interruption will result in longer time to complete the task than positive emotions. This hypothesis was supported ($\beta = .34$, $p < .001$). The emotional reaction to being interrupted influenced task completion time such that the more negative the emotional reaction, the larger the NGD estimation (see Table 3). Hypothesis 4 tests the idea that prior history with a person will influence the person's emotional reaction to being interrupted by that person. Upon inspecting the plots, I found issues with normality (see Figure 9), though the linearity did not appear to be a serious issue (see Figure 10). After performing several transformations (natural log, square, square root), the square root transformation appeared to improve the problems (see Figures 12 - 14). The regression results are from the square root transformation of

the DV. Hypothesis 4 was supported (β = -.19, p < .01), and the negative sign indicates that, contrary to Study 1, interruptions from friends or family resulted in more positive emotion than did interruptions from work related sources (see Table 4).

Hypothesis 5a states that where in the task (early vs. late) the person is interrupted will have an effect on their emotion. This hypothesis was not supported (β = -.05, n.s.), however, when the DV was their emotional reaction to their progress on the task, the relationship became significant, though in the opposite direction than predicted, the later in the task progress they were interrupted, the more positive their emotion (β = -.18, p. < .05; see Table 5). Hypothesis 5b suggests that where in the task (early vs. late) the person is interrupted will have an effect on their goal progress. This hypothesis did not receive support (β = -.04, n.s.). Being interrupted at any point from after having just started to close to completion did not influence goal progress. Hypothesis 6 suggests that chat unrelated to work will result in more negative affect. This hypothesis was not supported (β = .01, n.s.). Superfluous chat included in the interruption did not result in more felt negative affect than an interruption that did not include chat.

Hypothesis 7 states that an interruption perceived as helpful will result in the duration of the interruption lasting longer than an interruption perceived as harmful. The hypothesis was tested using the natural log of the interruption duration. When the plots for the interruption duration were examined, several problems were obvious. The distribution is extremely leptokurtic (see Figure 18), the regression residuals are not linearly distributed (see Figure 19), and the scatterplot of the residuals indicates a fan shape (see Figure 20). Following the natural log transformation of the interruption duration variable, the distribution better approximated normal (though still somewhat leptokurtic, see Figure 21), the probability plot showed better linearity (see Figure 22), and the residual scatterplot lost the fan shape (see Figure 23).

Hypothesis 7 was not supported, but was significant in the opposite direction ($\beta = .36$, $p < .001$). Interruptions perceived as harmful resulted in a longer duration interruption than those perceived as helpful, which may stem from the perception that long interruptions are in themselves harmful (see Table 6).

Hypothesis 8 states that an interruption that results in negative emotions will lead the interrupted person to shorten the duration of the interruption. Consistent with the above findings, this hypothesis was

not supported (β = .10, n.s.). The interrupted person's emotional state had no effect on the duration of the interruption. Hypothesis 9 deals with NGD and PGD estimations such that a NGD will lead to more negative emotion than a PGD or "on track" estimation. This hypothesis received support (β = .38, $p < .001$). A perceived NGD led to negative feelings about the subject's progress on the task that had been interrupted (see Table 7).

H12 states that the length of the interruption will influence TIP progress. Hypothesis 12 was significant (β = .40, $p. <.001$). The longer the interruption duration, the greater the negative goal discrepancy reported by the participants (see Table 8). Hypothesis 13 states that PGDs will result in a greater need to shuffle one's remaining tasks for the day. This hypothesis was not supported, but was significant in the opposite direction (β = .51, $p. < .001$) suggesting that a Negative Goal Discrepancy led to a greater need to shuffle the remaining day's tasks (see Table 9).

Discussion

The above results show support for negative emotion and productivity outcomes as a result of being interrupted. Hypothesis 2 states that interruptions perceived as harmful will lead to more negative emotion than will those perceived as helpful. While support for this hypothesis may appear obvious, emotions are not always welcome at work, and as such it is possible that people would not react to the nature of the interruption. From these findings it would appear that, at least for this sample, emotional reactions to interruptions overcome the norm of emotion suppression at work. These negative emotions also lead the individuals experiencing them to take longer to complete the TIP (H3). This is consistent with Frijda's assertion that emotions take precedence over other needs (1993). Hypothesis 4 tested the idea that prior history with a person would influence the person's emotional reaction to being interrupted by that person. While this hypothesis received support, hypothesis 8, which states that negative affect will lead the person to shorten the interruption, was not supported. This hypothesis was tested using the emotional reaction to being interrupted, but when tested with the emotional reaction to the person interrupting, it also failed to reach

significance (β = -.01, n.s.). This finding may be explained by the work positions the subjects hold. All subjects work in administrative positions and may have little power to end interruptions by others, especially when the interrupting person is their boss or a customer. Providing additional support, hypothesis 7 (an interruption perceived as helpful will result in the duration of the interruption lasting longer) was not supported, but instead was significant in the opposite direction. It would appear that the content of the interruption and the person's emotional reaction are both important in predicting interruption duration.

Hypothesis 5a states that where in the task (early vs. late) the person is interrupted will affect their emotion, and hypothesis 5b suggests that where in the task the person is interrupted will affect their goal progress, more specifically, they suggest that the accumulation of effort, or cognitive workload, would be greater at or near the end of a task and would, therefore, be more detrimentally disturbed by an interruption. Neither of these hypotheses was supported, however, hypothesis 5a was significant in the opposite direction. These hypotheses were predicated on the idea that the subjects work on lengthy, cognitively engaging tasks. It is possible, and highly likely, that the subjects in this study do not work on those

types of tasks. What is more likely, and would explain the findings of 5a, is that they have several tasks of short duration but with urgent deadlines. Lending support to this possibility is the inclusion criterion I used when approaching different departmental supervisors to recruit participants--that the employees work on multiple tasks in any given day.

Hypothesis 6 suggests that chat unrelated to work will result in more negative affect. This hypothesis stemmed from the literature as well as the findings of study 1. The non-significant findings may be due to an unmeasured variable such as task or job boredom. As Jett and George suggested, interruptions can alleviate the negative affect associated with boredom (2003). Interestingly, the outcome was not significant in the opposite direction, so if boredom is the potential confound here, either not all subjects are bored at work or they are not bored all the time. This is definitely something to investigate in the future. Hypothesis 9 deals with NGD and PGD estimations such that an NGD will lead to more negative emotion than a PGD or "on track" estimation. As would be expected, this was supported, though potentially this would not have received support had the subjects been contacted at varying times during the day. It is possible that the NGD would necessitate staying late at work to finish tasks, or if the

individual could wait until the next day to finish, the NGD most likely would create NGDs for the tasks to be completed the following day. Hypothesis 12 suggested that the length of the interruption would influence TIP progress. This was supported. Although somewhat obvious, that the longer the interruption, the greater the NGD, as was found in previous studies (Zijlstra et al., 1999) subjects could have simply increased their pace to complete the task on time. This finding raises one of the limitations of this study, that all variables were collected from a single source. It is possible that their NGD estimation was inaccurate or influenced by other factors. Hypothesis 13 states that PGDs will result in a greater need to shuffle one's remaining tasks for the day. This hypothesis was designed to give a preliminary test of part of the Spacing and Pacing theory in which goal discrepancies, positive or negative, are expected to result in a need to rework the initial task completion plan. While NGDs led to greater negative emotion, it was expected that PGDs would lead to a larger need to rearrange the remaining tasks. The time of day the survey occurred may provide some explanation of the findings. A PGD at the end of the day may result in the person simply stopping work for a while, for the day or possibly creating their plan for the following day. An NGD, on the other hand, could result in a serious time crunch wherein the

person would need to quickly adjust the plan to the goal discrepancy and try to work on as many tasks as possible before leaving for the day.

Limitations

While this study found interesting relationships, it was not without its limitations. The small number of respondents (N=31) is potentially a limitation of this study, and ESM is used specifically for studies conducted when it is difficult to gain access to large numbers of subjects and in field settings (Beal & Weiss, 2003). The data analysis method, pooled within-person regression, is appropriate for data collected regarding daily experiences , though this method does not model within-person slopes and intercepts as random coefficients (Beal & Weiss, 2003).

Another limitation is the still somewhat retrospective nature of the survey. As I did not wish to confound the findings by interrupting them with my survey, I chose to ask them to fill out the survey at the end of their workday regarding the last interruption experienced. The median time from the end of the interruption to the time they began the survey was 23 minutes and the mean was one hour.

As was mentioned above, in this sample, it appears that the largest influence comes from within-person variables, however, there

are several components of this study that would suggest that the subjects are extremely similar to one another. The tasks , their level of difficulty, and their level of importance are similar as all the subjects are secretaries. All surveys were completed at the end of their workday, their recall was within one hour, and they all work on similar tasks. This points to personality similarities between the subjects as they self-selected into this occupation, thus minimizing the influence of individual differences.

One potentially omitted variable is the issue of job satisfaction. As Jett and George (2003) suggested, interruptions can result in either positive or negative emotions. Job satisfaction potentially would moderate the interruptions-emotions link such that people who dislike their jobs may be happier about being interrupted and those who like or are satisfied with their jobs, may experience more negative emotional reactions to being interrupted. Additionally, the issue of interruptions being commonplace was not assessed. As these subjects all work in administrative, secretarial-type positions it is likely that they experience multiple interruptions in any given day.[1] This assertion makes the small findings more powerful. Interruptions

[1] In conversations with the subjects' supervisors, this was found to be the case. The subjects experienced multiple interruptions on a daily basis, and the supervisors viewed these interruptions as simply a part of the employees' jobs.

Theory (Mandler, 1964; 1989) would suggest that interruptions should become part of an organized sequence, and therefore, fail to produce any emotional or performance outcomes, yet as the data showed, this was not the case.

As was mentioned in the discussion, the questions for the independent variables and dependent variables were collected from a single source, the employee. The employee was the best source for answering questions regarding the interruption attributes and their emotions about those attributes, and in the absence of an external, unbiased measure of goal discrepancy (e.g., a computer tracking program), the employee was the best source for providing an account of their progress on the interrupted task as well as their day's tasks. While some performance data from a supervisor may have provided triangulation materials, if the managers were not aware of the employee's daily goals (e.g., if the managers were not micro-managers), it is entirely possible that they would not have had enough knowledge of the employee's progress on daily tasks, and therefore, the data from them would most likely not have been related to the employees' self-reported progress. As field settings typically suffer from these and several other natural confounds,

Study 3 was conducted in a controlled lab setting to gain a better understanding of the interruptions-performance link.

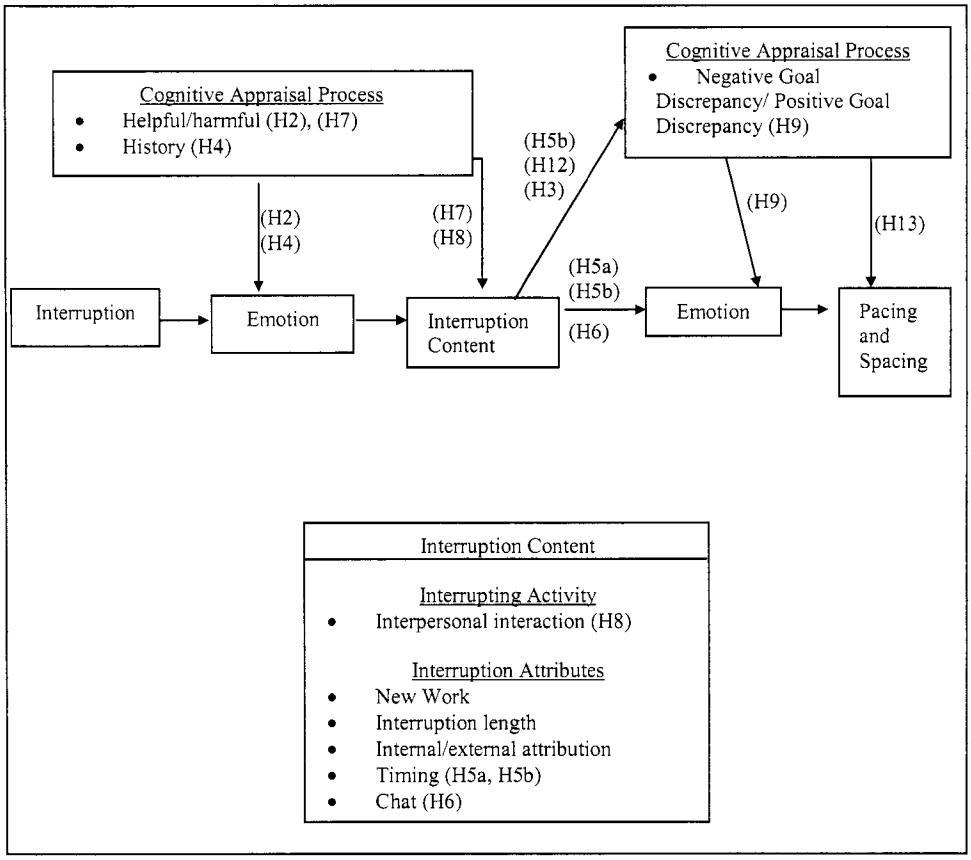


Figure 5: Study 2 Tested Model

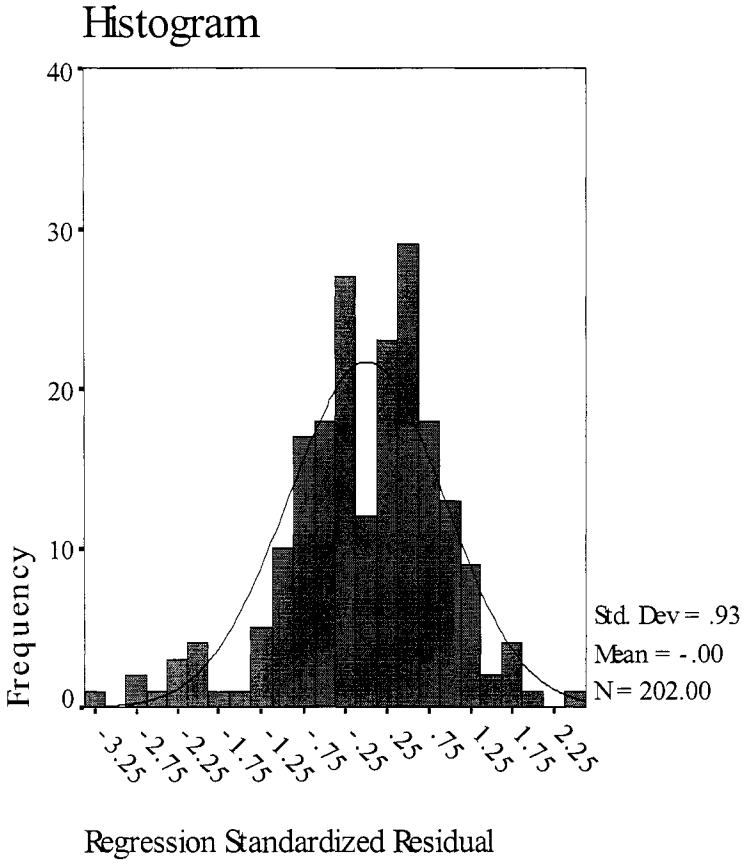


Figure 6: Hypothesis 2 Emotional reaction to Being Interrupted Histogram with normal curve.

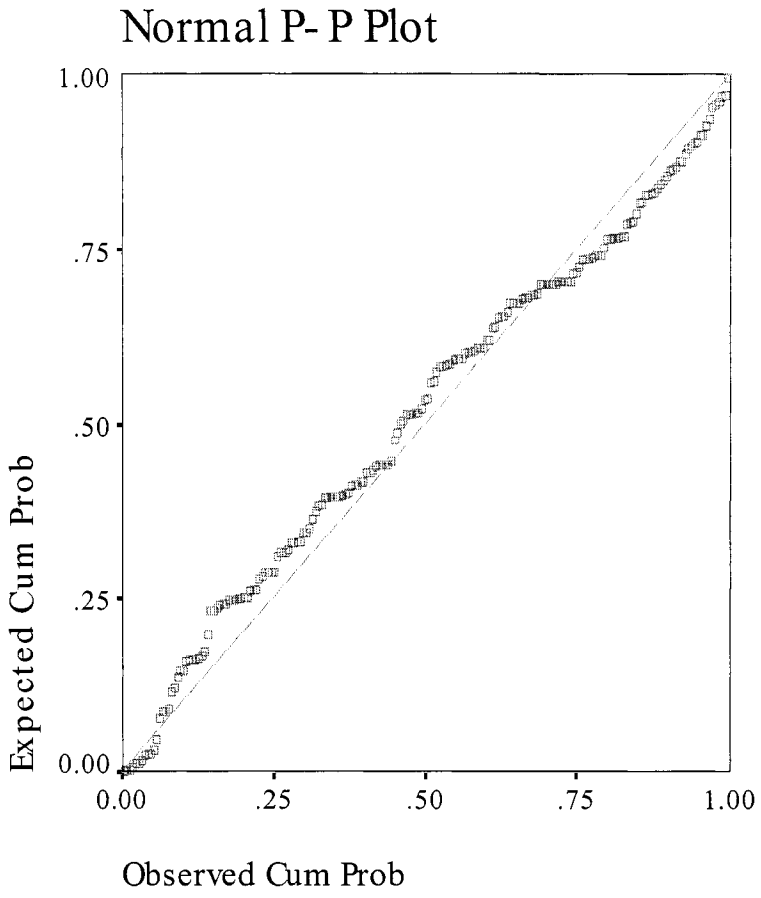


Figure 7: Hypothesis 2 Normal Probability Plot of Regression Standardized Residual DV: Emotional Reaction to Being Interrupted

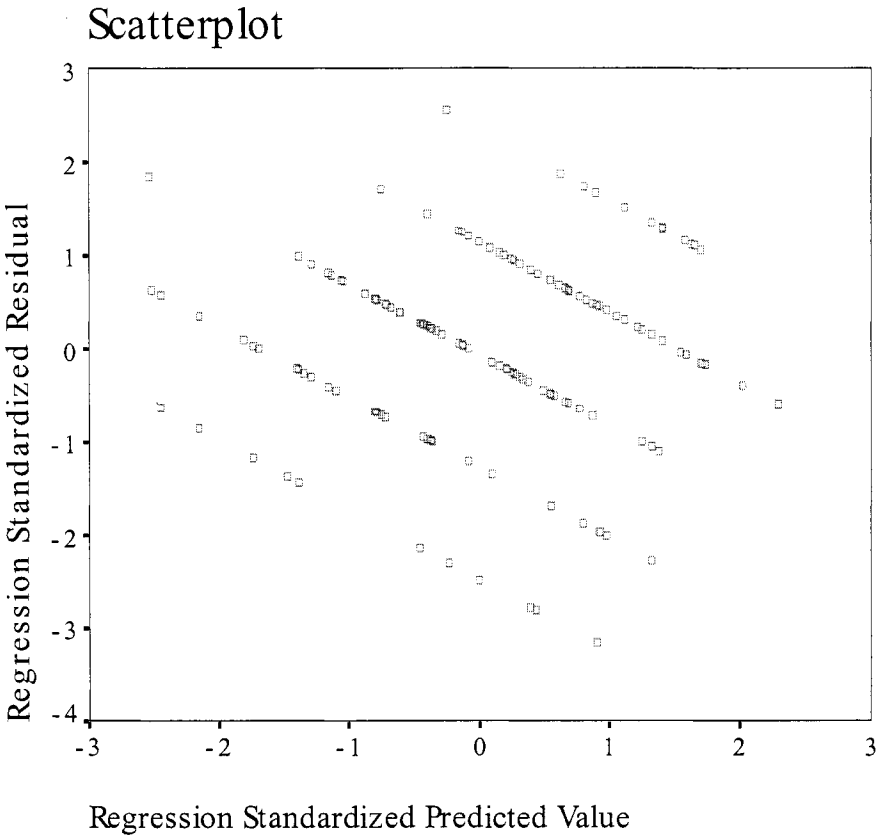


Figure 8: Hypothesis 2 Residuals Scatterplot DV: Emotional Reaction to Being Interrupted

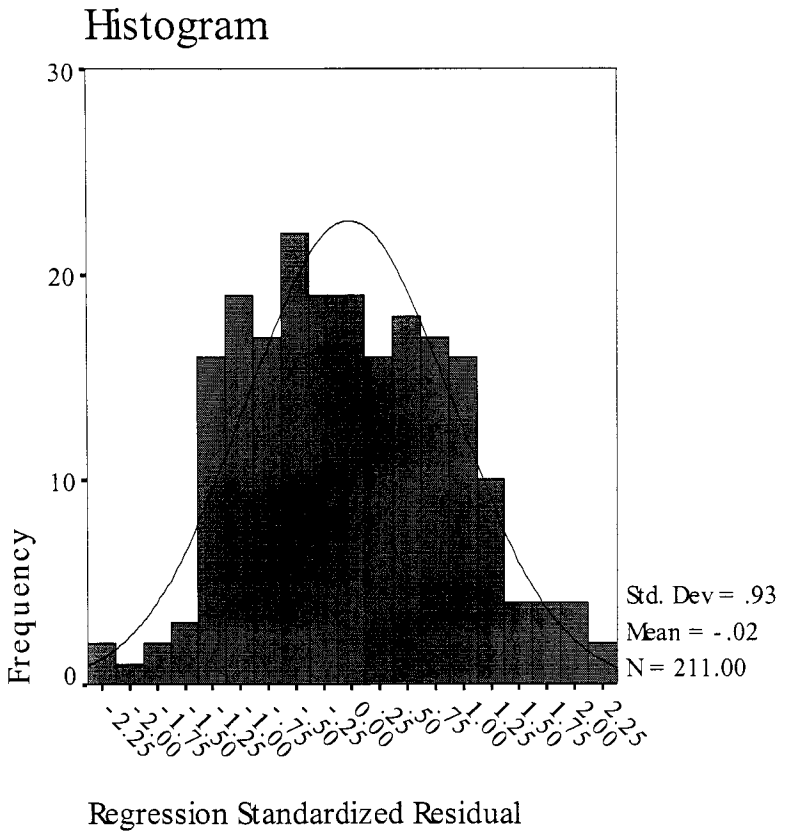


Figure 9: Hypothesis 3 Histogram with normal curve DV: NGD/PGD

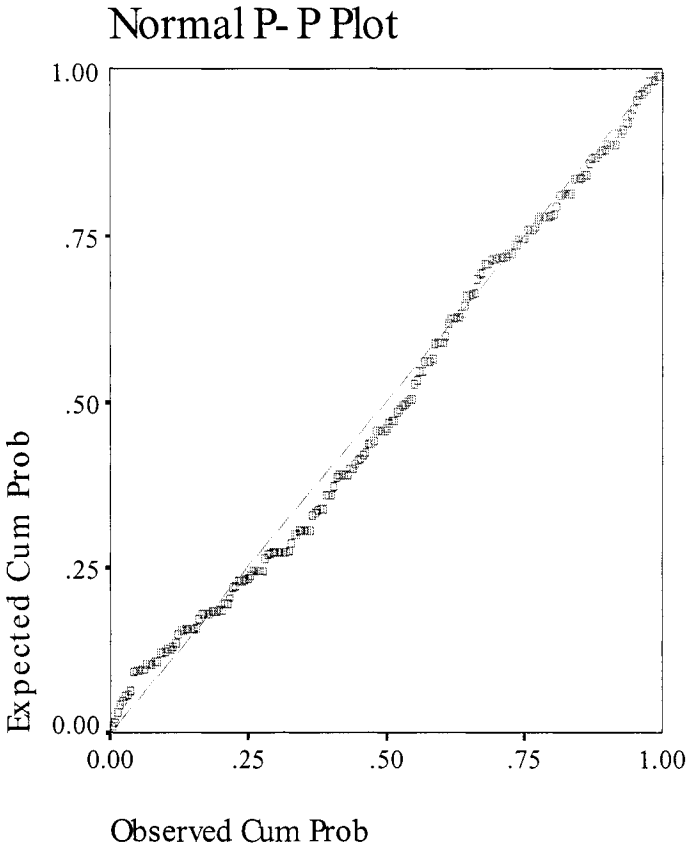


Figure 10: Hypothesis 3 Normal Probability Plot for Regression Standardized Residual DV: NGD/PGD

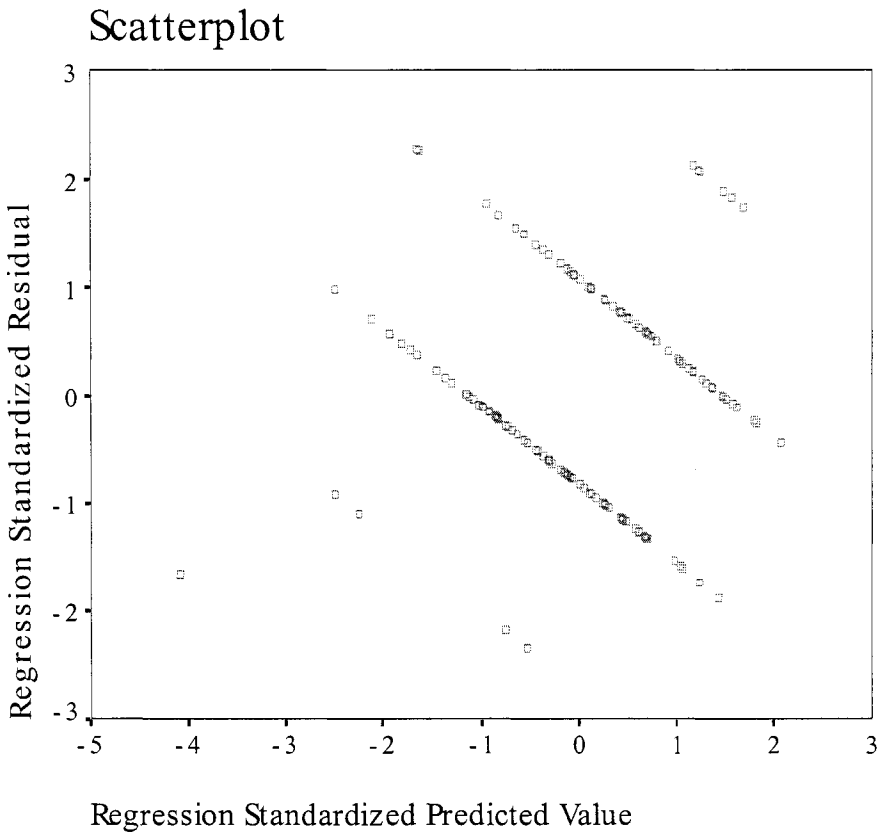


Figure11: Hypothesis 3 Residuals Scatterplot DV = NGD/PGD

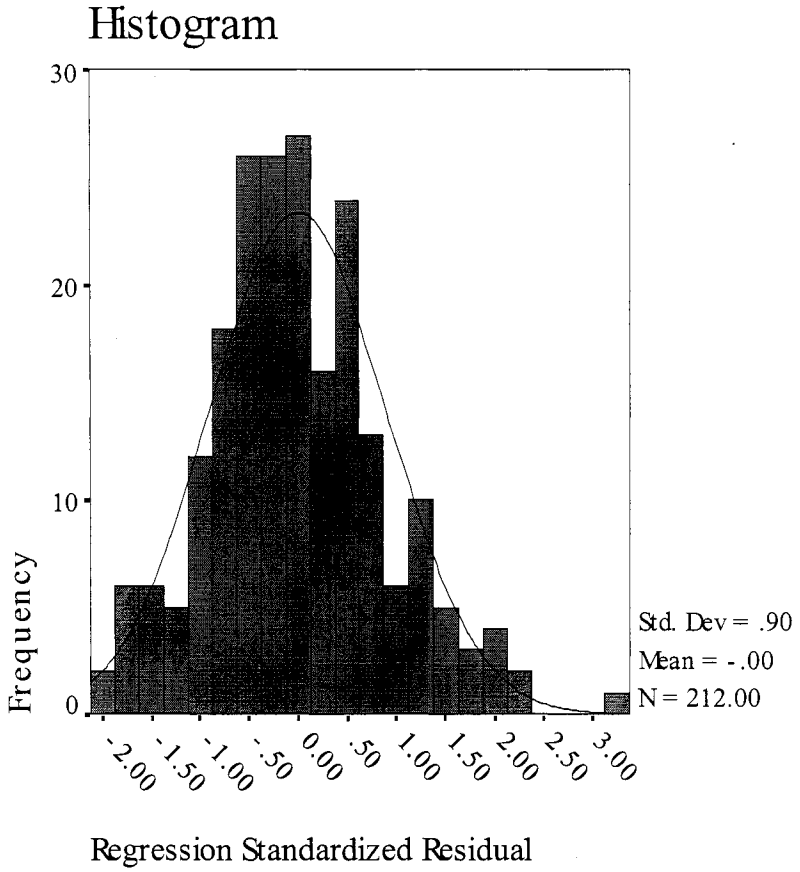


Figure 12: Hypothesis 4 Histogram with normal curve DV: Emotional Reaction to Interrupting Person

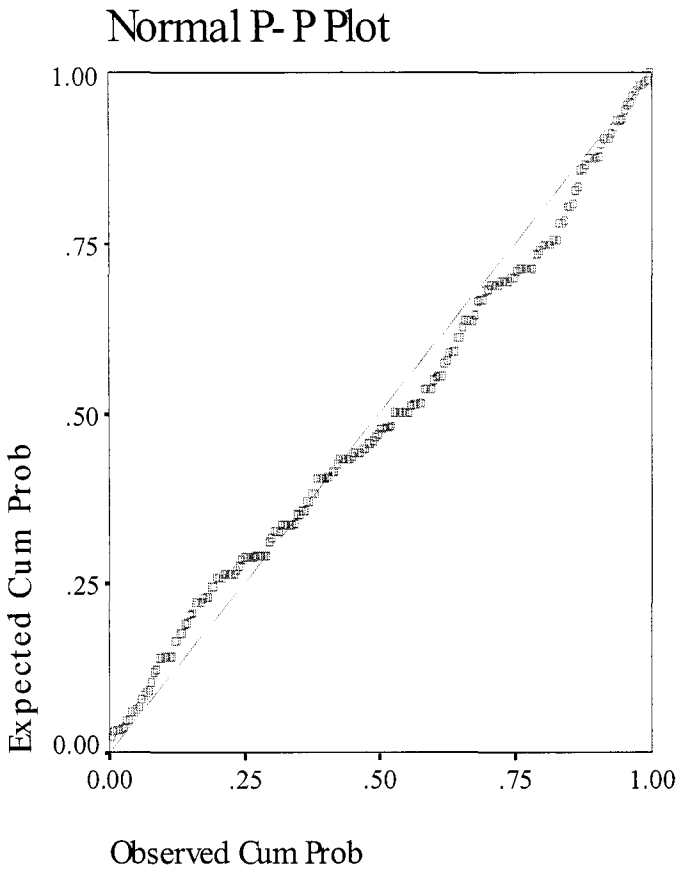


Figure 13: Hypothesis 4 Normal Probability Plot for Regression Standardized Residual DV: Emotional Reaction to the Interrupting Person

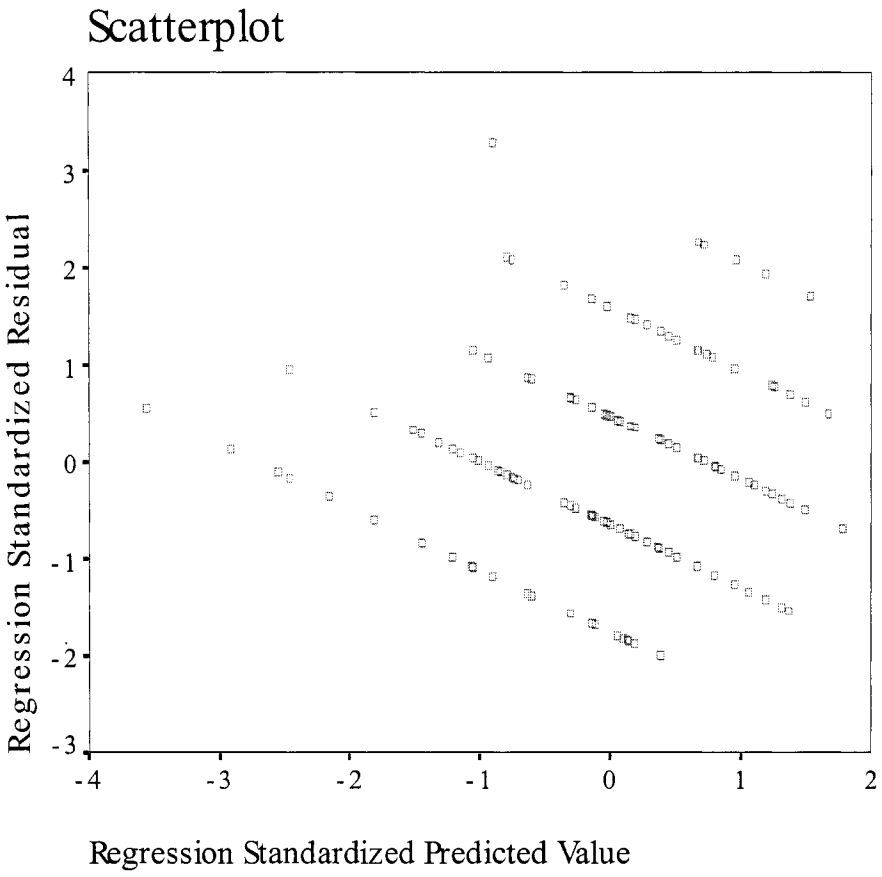


Figure 14: Hypothesis 4 Scatterplot DV: Emotional Reaction to the Interrupting Person

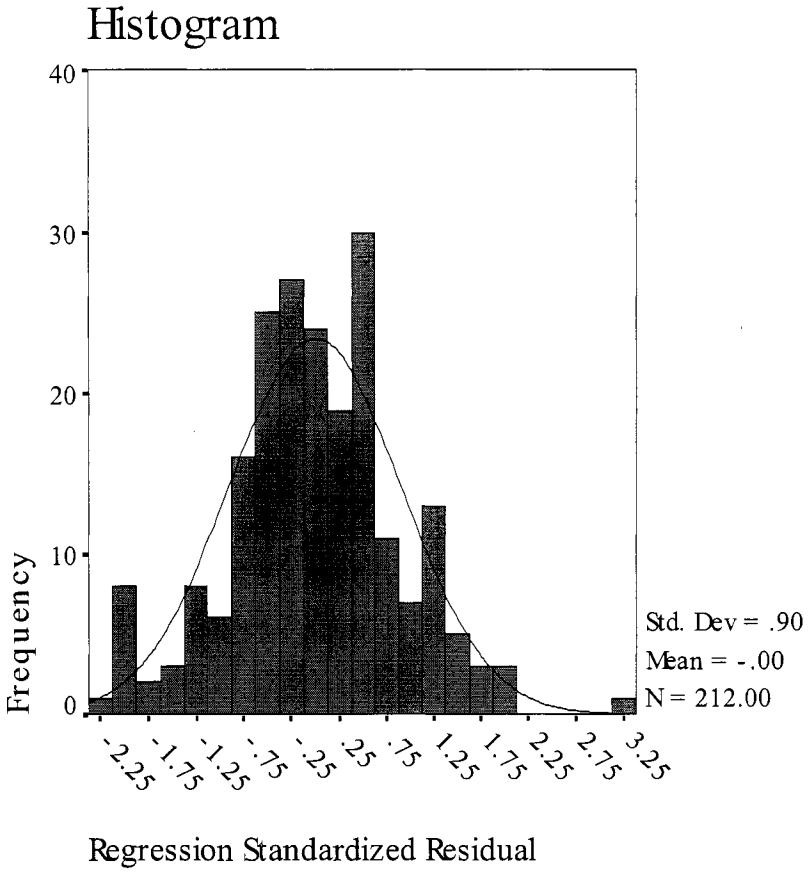


Figure 15: Hypothesis 4 Histogram with Normal Curve DV: Square Root of the Emotional Reaction to the Interrupting Person

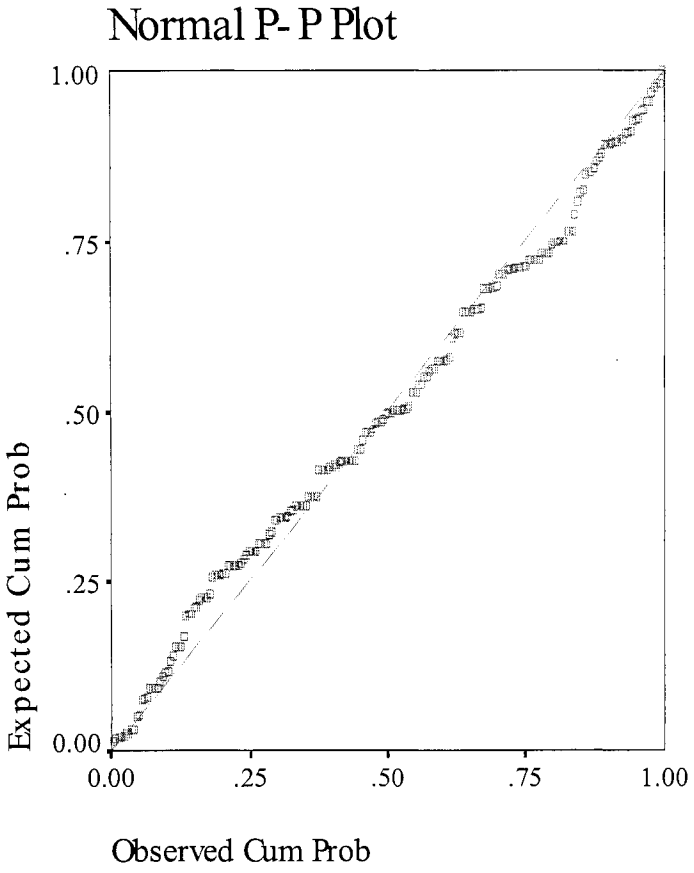


Figure 16: Hypothesis 4 Normal Probability Plot for Regression Standardized Residual DV: Square Root of the Emotional Reaction to the Interrupting Person

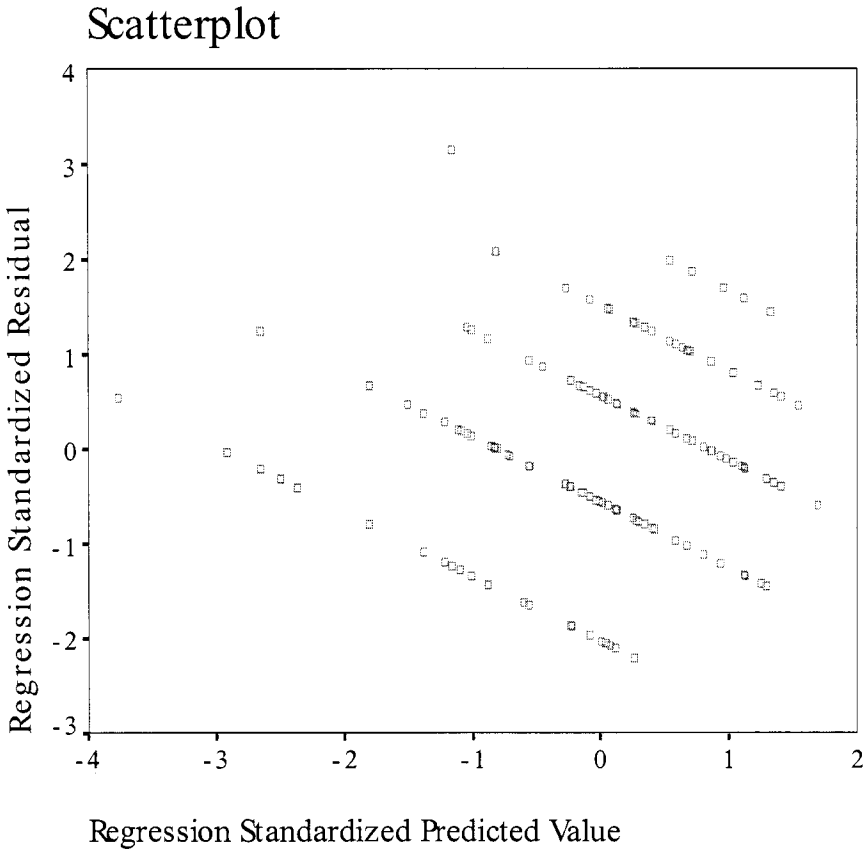


Figure 17: Hypothesis 4 Residuals Scatterplot DV: Square Root of the Emotional Reaction to the Interrupting Person

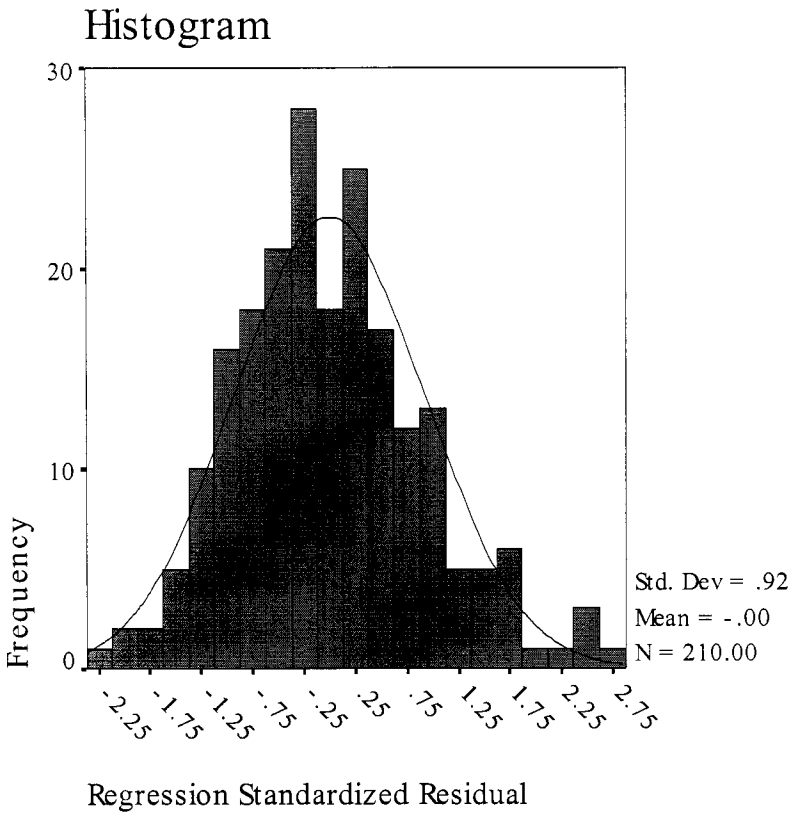


Figure 18: Hypothesis 5a Histogram with normal curve DV: Emotional Reaction to Progress on the Interrupted Task

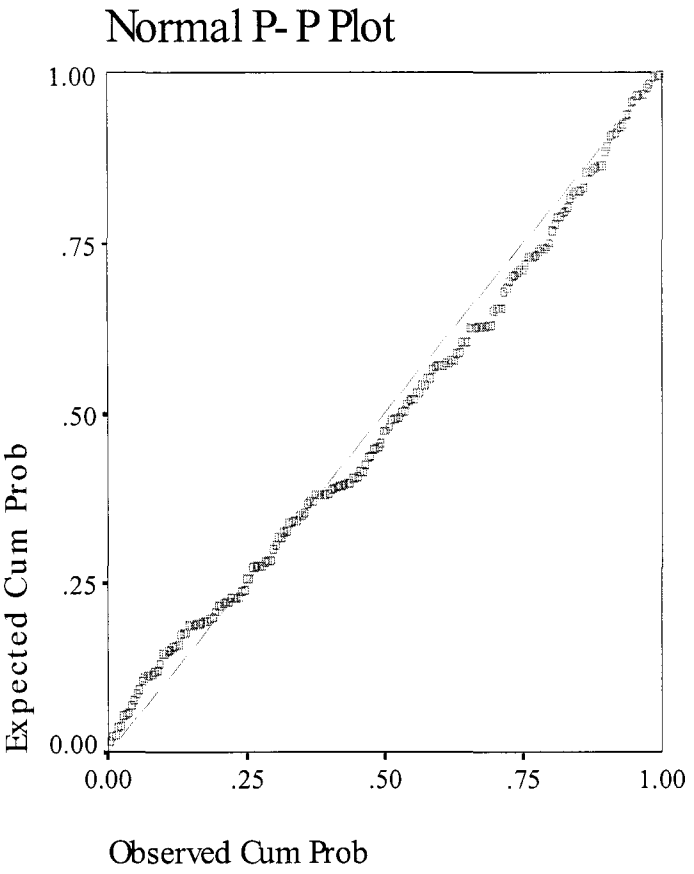


Figure 19: Hypothesis 5a Normal Probability Plot for Regression Standardized Residual DV: Emotional Reaction to Progress on the Interrupted Task

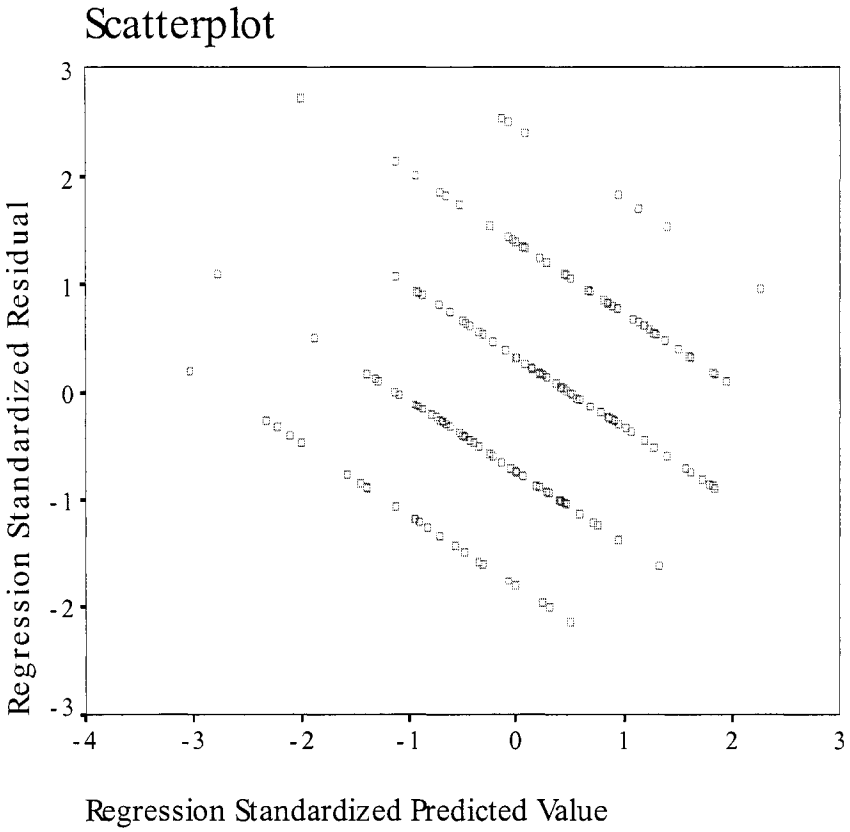


Figure 20: Hypothesis 5a Residuals Scatterplot DV = Emotional Reaction to Progress on the Interrupted Task

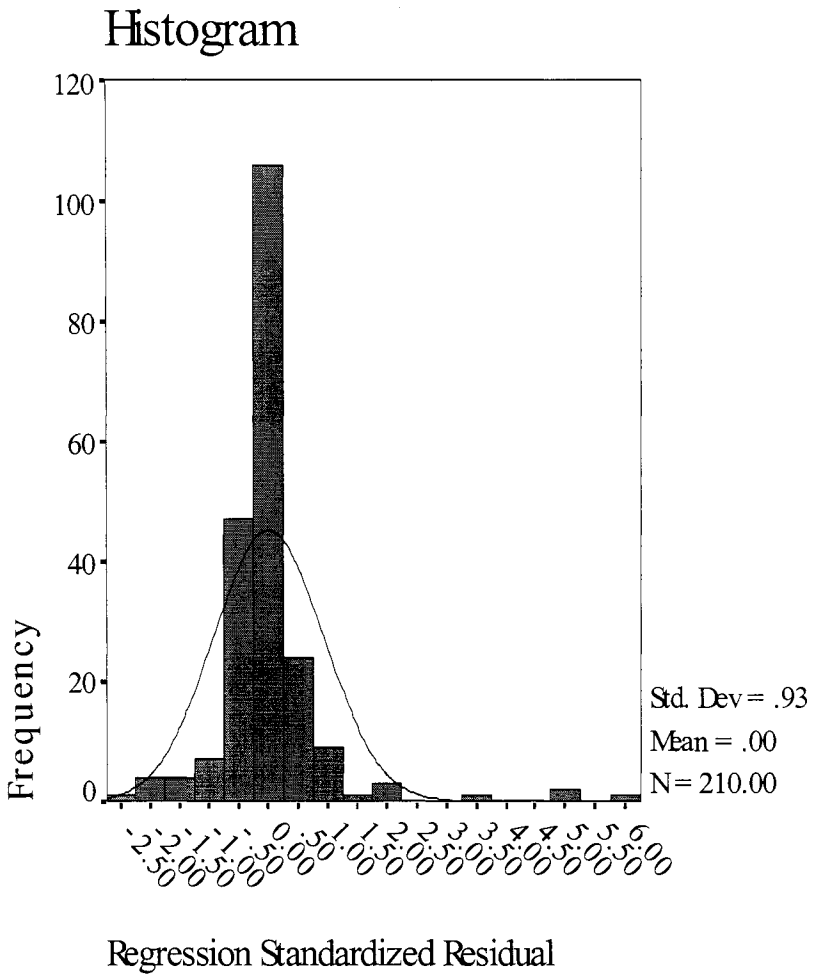


Figure 21: Hypothesis 7 Histogram with Normal Curve DV: Interruption Duration

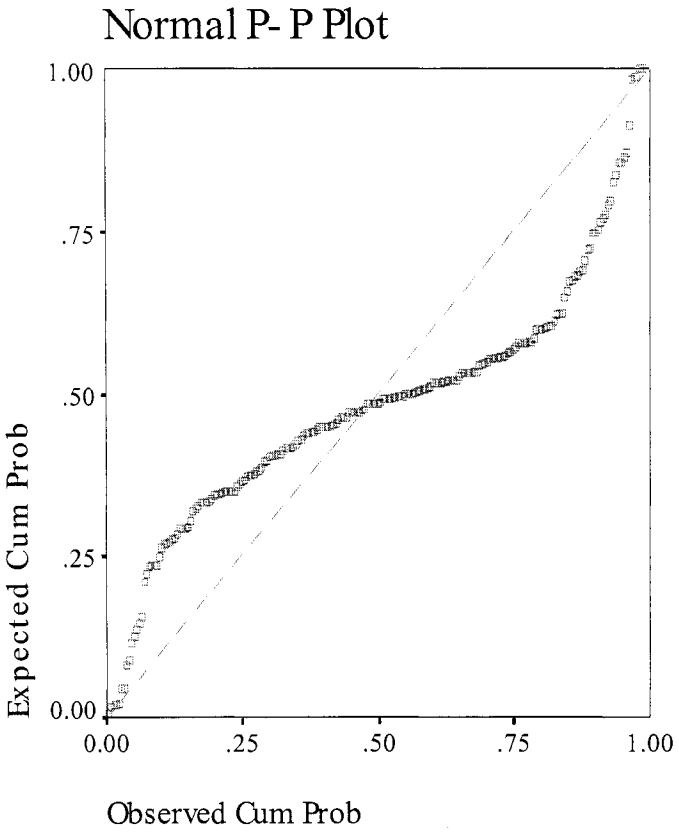


Figure 22: Hypothesis 7 Normal Probability Plot for Regression Standardized Residual DV: Interruption Duration

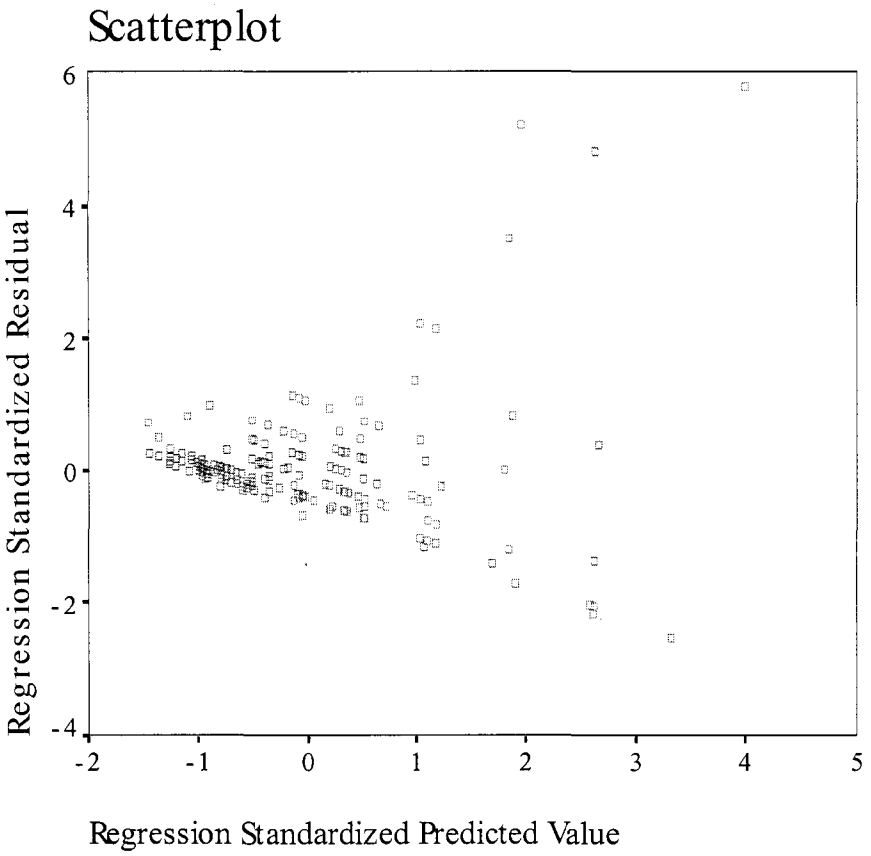


Figure 23: Hypothesis 7 Residuals Scatterplot DV: Interruption Duration

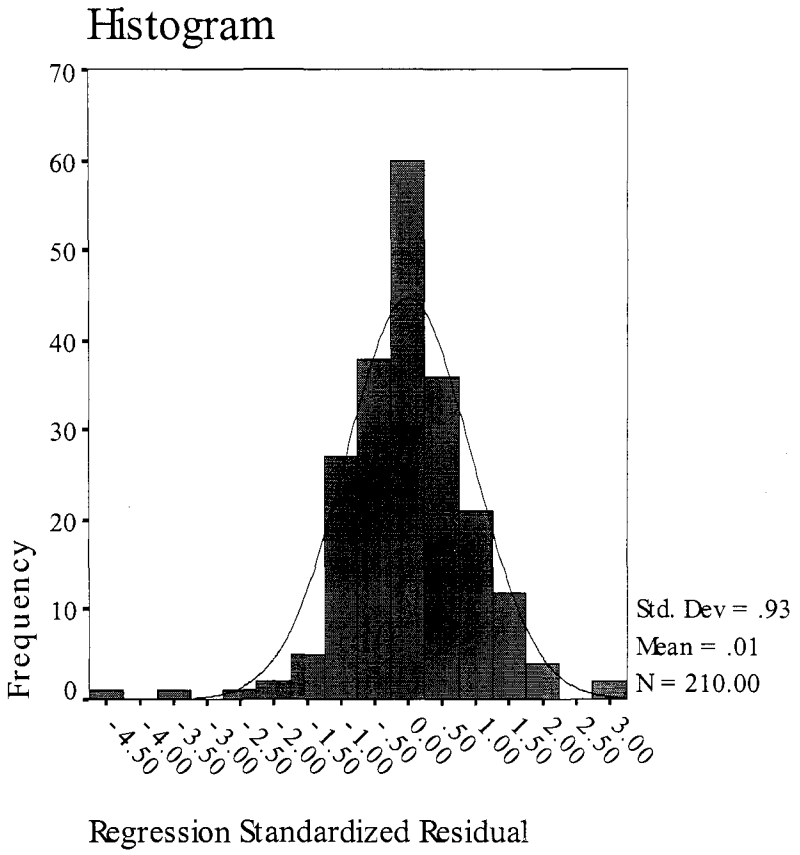


Figure 24: Hypothesis 7 Histogram with normal curve DV: Natural Log of Interruption Duration

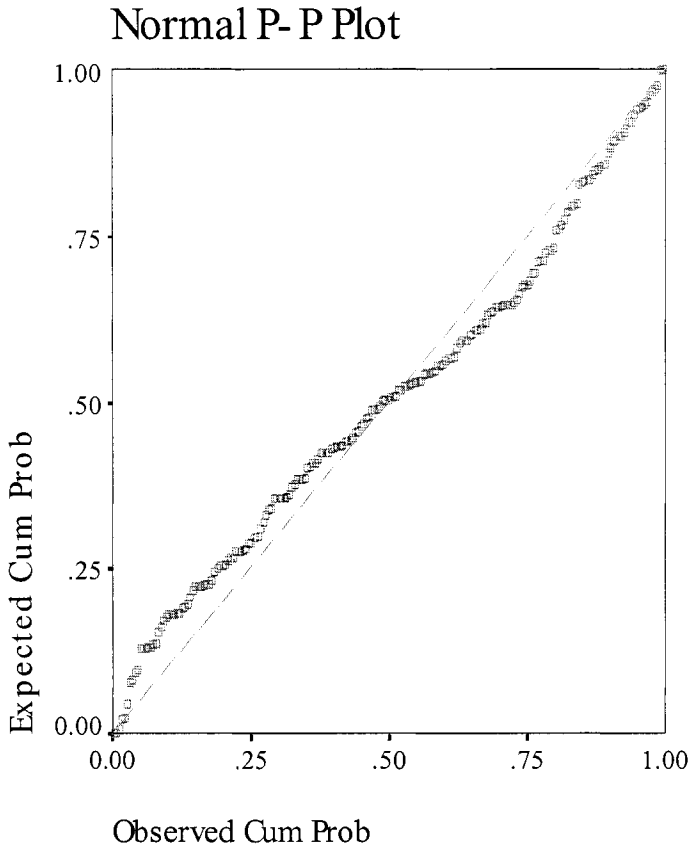


Figure 25: Hypothesis 7 Normal Probability Plot for Regression Standardized Residual DV: Natural Log of Interruption Duration

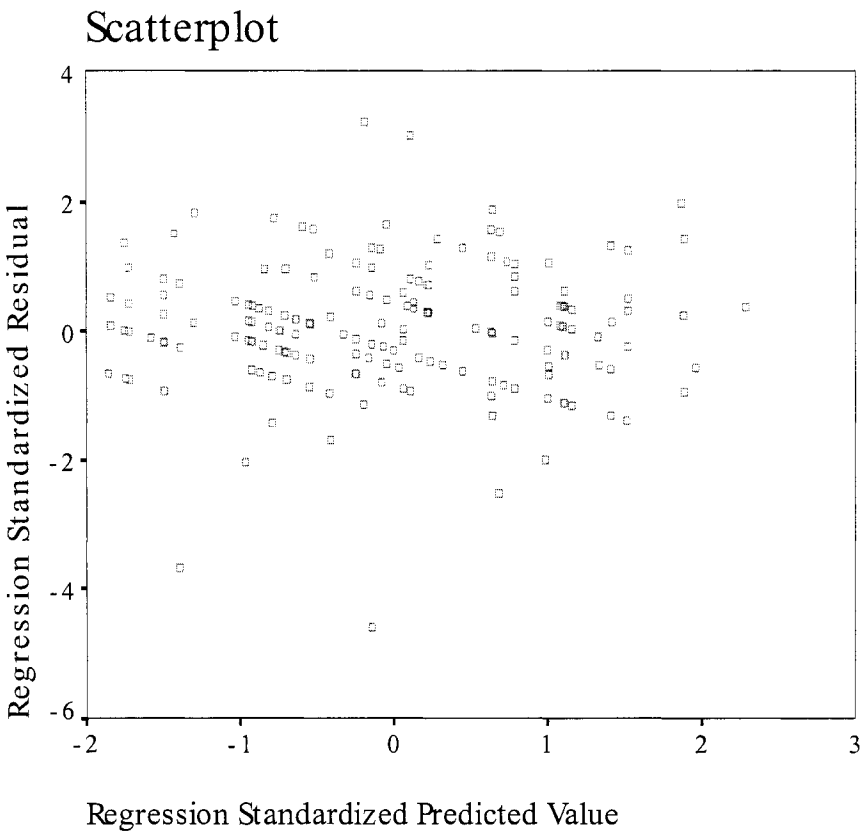


Figure 26: Hypothesis 7 Residuals Scatterplot DV: Natural Log of Interruption Duration

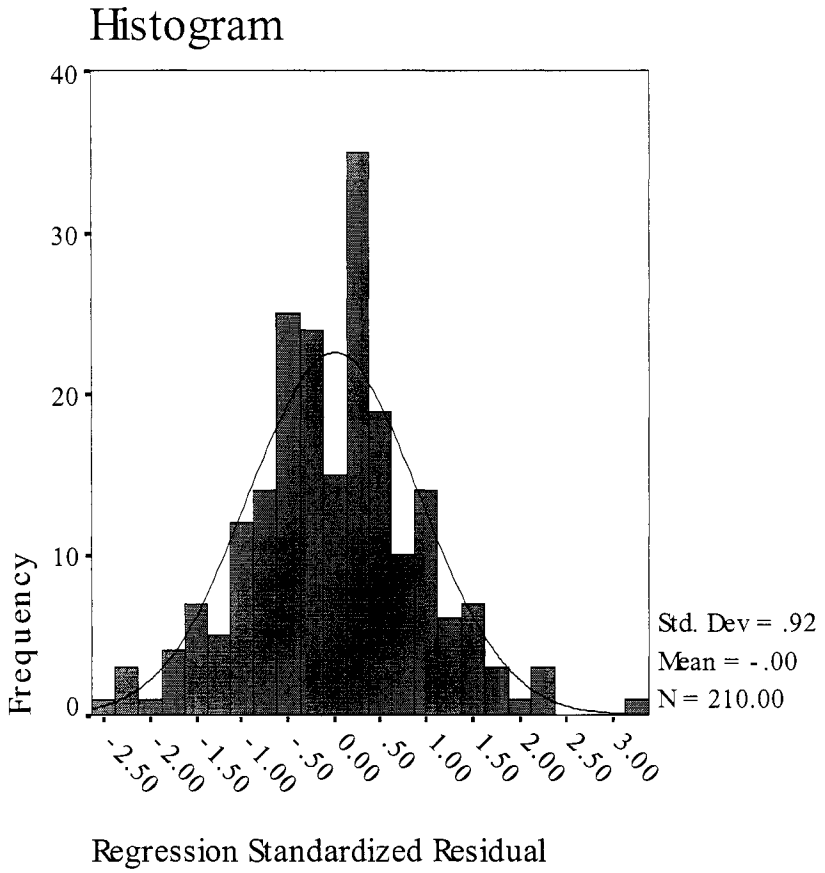


Figure 27: Hypothesis 9 Histogram with normal curve DV: Emotional Reaction to Progress on the Interrupted Task

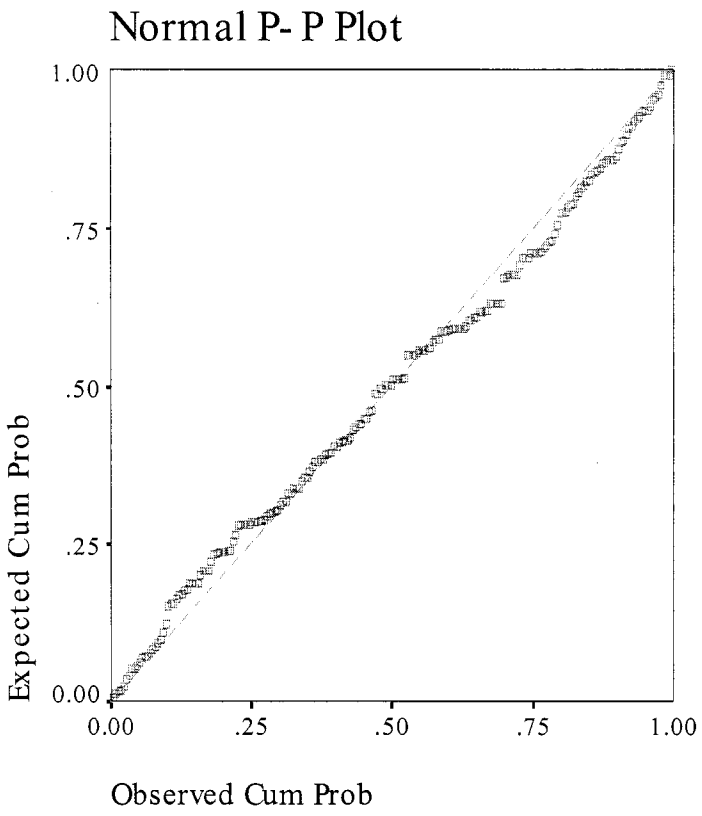


Figure 28: Hypothesis 9 Normal Probability Plot for Regression Standardized Residual DV: Emotional Reaction to Progress on the Interrupted Task

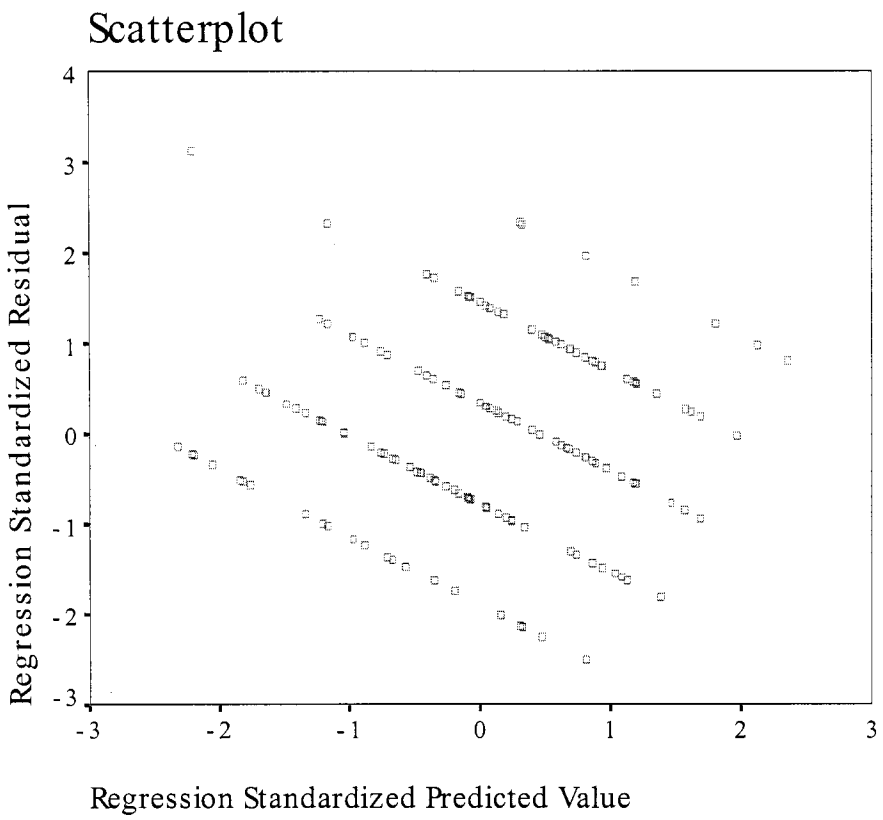


Figure 29: Hypothesis 9 Residuals Scatterplot DV: Emotional Reaction to Progress on the Interrupted Task

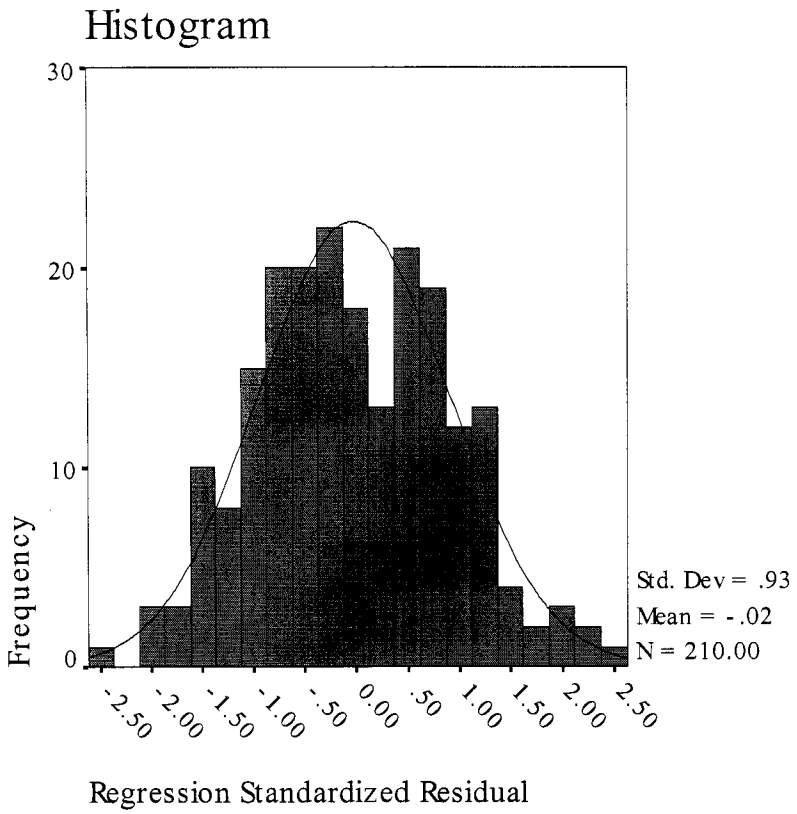


Figure 30: Hypothesis 12 Histogram with Normal Curve DV: NGD/PGD

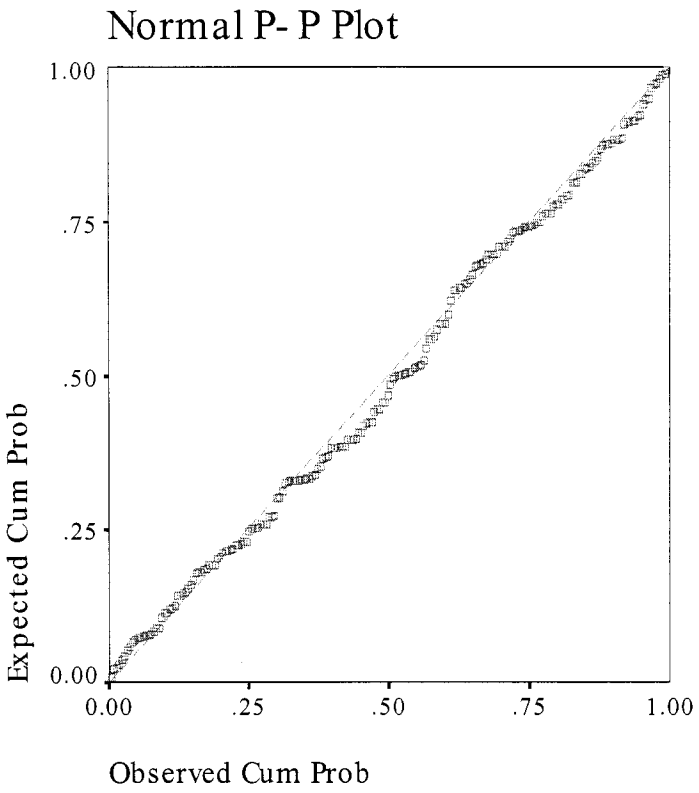


Figure 31: Hypothesis 12 Normal Probability Plot for Regression Standardized Residual DV: NGD/PGD

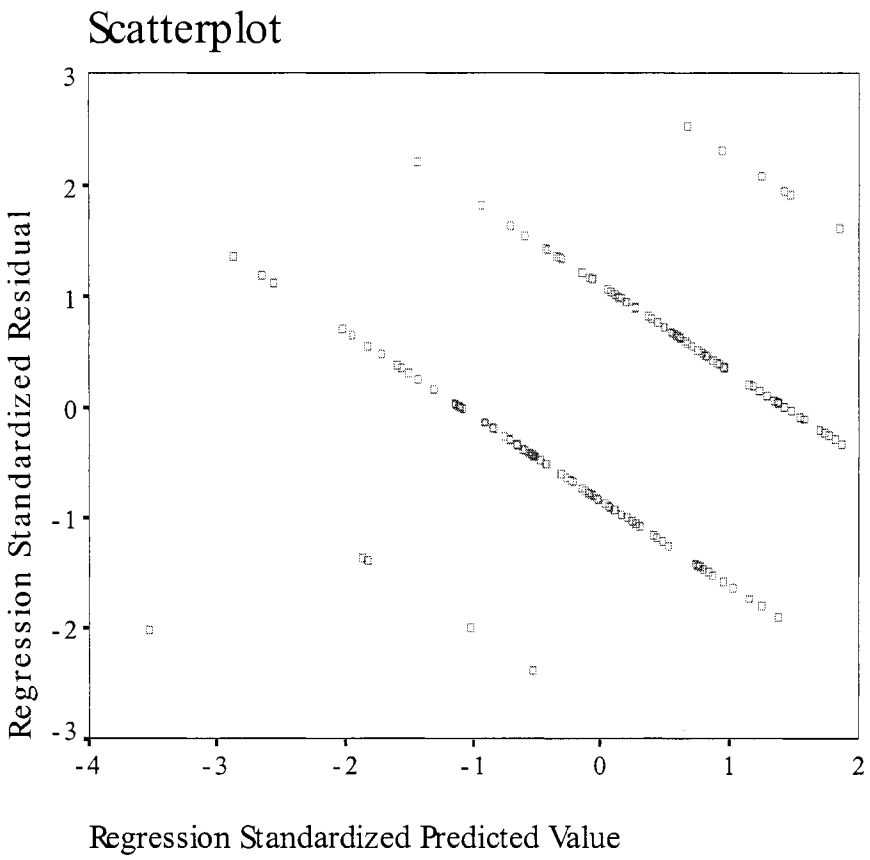


Figure 32: Hypothesis 12 Residuals Scatterplot DV: NGD/PGD

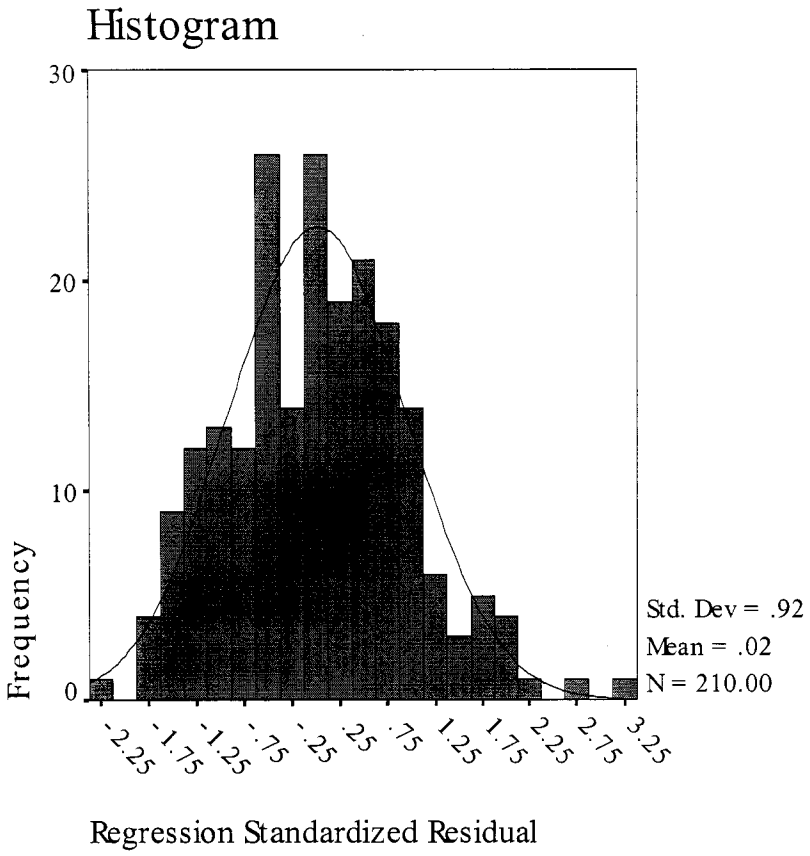


Figure 33: Hypothesis 13 Histogram with normal curve DV: Shuffle

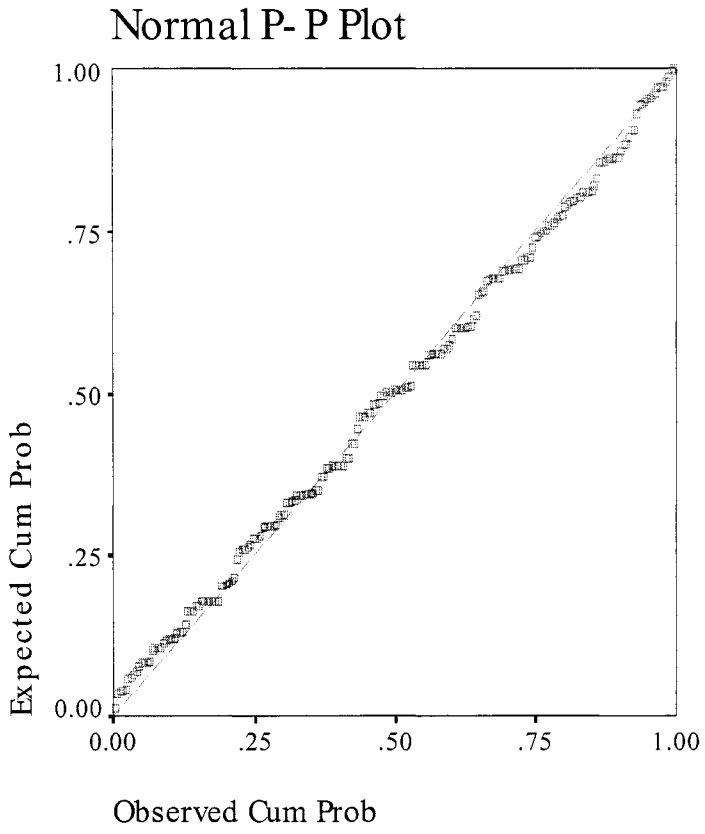


Figure 34: Hypothesis 13 Normal Probability Plot for Regression Standardized Residual DV: Shuffle

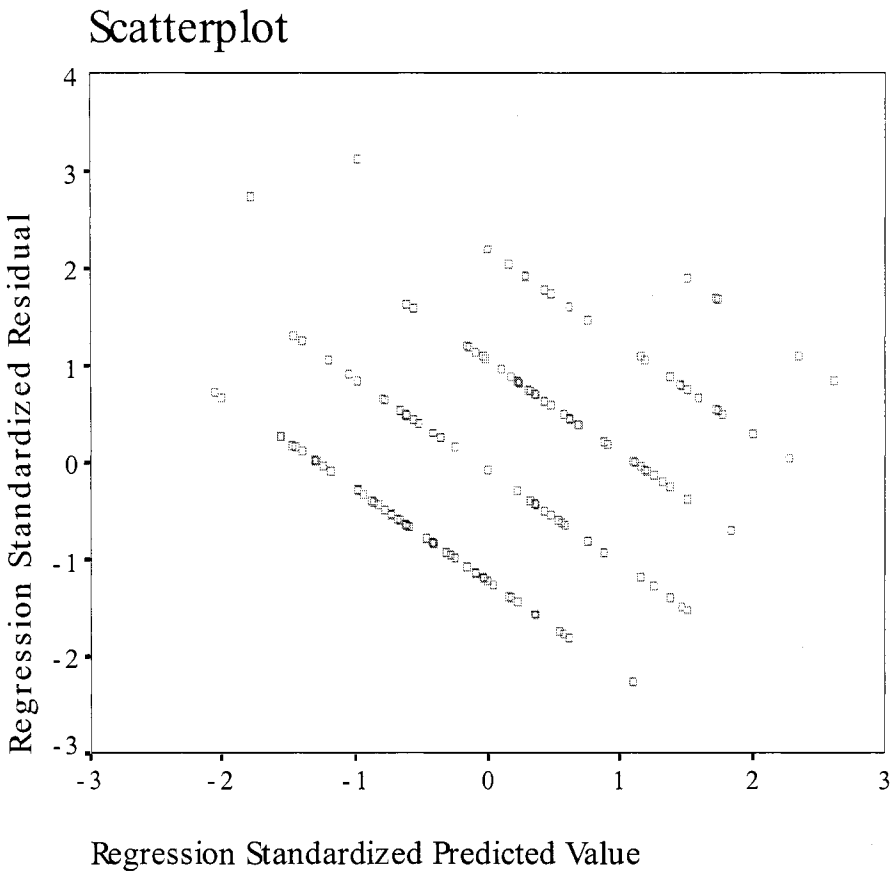


Figure 35: Hypothesis 13 Residuals Scatterplot DV: Shuffle

Table 1: Means, Standard Deviations, and Correlations

Variable	Mean	S.D.	1	2	3	4	5
1. Morning Mood	2.33	.923					
2. Dummy	.996	.061	-.045				
3. Chat	.38	.487	.049	.049			
4. Chat Emotion	2.53	1.076	.232**	-.039	-.103		
5. Interrupt Length	11.48	17.19	-.120	-.389**	-.063	.101	
6. Who interrupted	1.125	.331	.105	-.163**	.405**	-.040	.041
7. Interrupter Emotion	2.54	1.031	.223**	-.028	-.213**	.738**	.055
8. Where in task	2.90	1.431	-.106	.089	-.123	-.058	-.069
9. Helpful/ harmful	3.41	.659	-.127	.041	-.061	.381**	.190**
10. NGD/PGD	3.41	.602	-.081	.044	-.134*	.305**	.267**
11. Interruption Emotion	2.97	.999	.189**	.060	-.130*	.764**	.070
12. Progress Emotion	2.68	1.048	.168*	-.084	-.109	.433**	.160*
13. Shuffle	2.04	1.164	.028	.002	-.098	.195*	.318**

**Correlation is significant at the 0.01 level (2-tailed).

*Correlation is significant at the 0.05 level (2-tailed).

Table 1 continued

Variable	6	7	8	9	10	11	12
1. Morning Mood							
2. Dummy							
3. Chat							
4. Chat Emotion							
5. Interrupt Length							
6. Who interrupted							
7. Interrupter Emotion	-.188**						
8. Where in task	-.062	.027					
9. Helpful/ harmful	-.013	.283**	-.063				
10. NGD/PGD	-.072	.238**	-.044	.715**			
11. Interruption Emotion	-.068	.697**	-.003	.383**	.352**		
12. Progress Emotion	-.035	.248**	-.206**	.383**	.338**	.320**	
13. Shuffle	-.086	.110	-.098	.507**	.538**	.164**	.376**

**Correlation is significant at the 0.01 level (2-tailed).

*Correlation is significant at the 0.05 level (2-tailed).

Table 2: Hypothesis 2 Summary of Hierarchical Regression Analysis for Variables Predicting Emotional Reaction to Being Interrupted.

Variable	B	SE B	β
Step 1 Morning Mood	.21	.08	.19**
Step 2 Morning Mood Dummy	.14 -.21	.10 .51	.13 -.04
Step 2 Morning Mood Dummy Helpful/Harmful	.22 -.36 .66	.09 .46 .11	.19* -.06 .41***
Note: R^2 = .04 for Step 1; ΔR^2 = .23 for Step 2 (ps < .01) ; ΔR^2 = .13 for Step 3 (ps < .001) * p < .05; **p < .01, ***p < .001			

Table 3: Hypothesis 3 Summary of Hierarchical Regression Analysis for Variables Predicting NGD/PGD.

Variable	B	SE B	β
Step 1 Morning Mood	-.00	.05	-.07
Step 1 Morning Mood Dummy	-.10 .00	.06 .32	-.14 .01
Step 2 Morning Mood Dummy Emotional reaction to being interrupted	-.12 -.01 .22	.06 .30 .04	-.17* .02 .34***
Note: R^2 = -.00 for Step 1; ΔR^2 = .29 for Step 2 (ps < .001); ΔR^2 = .09 for Step 3 (ps < .001) * p < .05; **p < .01, *** p < .001			

Table 4: Hypothesis 4 Summary of Hierarchical Regression Analysis for Variables Predicting Emotional Reaction to the Person Interrupting.

Variable	B	SE B	β
Step 1			
Morning Mood	.01	.02	.23
Step 2			
Morning Mood	.01	.03	.17*
Dummy	-.15	.16	-.08
Step 3			
Morning Mood	.01	.03	.15
Dummy	-.27	.17	-.14
Who interrupted (work v. non-work)	-.22	.08	-.19**
Note: R^2 = .05 for Step 1; ΔR^2 = .28 for Step 2 (ps < .001); ΔR^2 = .03 for Step 3 (ps < .01)			
* p < .05; **p < .01, *** p < .001			

Table 5: Hypothesis 5a Summary of Hierarchical Regression Analysis for Variables Predicting Emotional Reaction to Progress on the Interrupted Task.

Variable	B	SE B	β
Step 1			
Morning Mood	.25	.08	.21**
Step 2			
Morning Mood	.28	.10	.23**
Dummy	.22	.54	.03
Step 3			
Morning Mood	.27	.10	.23**
Dummy	.33	.53	.05
Where in Task Progress	-.14	.06	-.18*
Note: R^2 = .04 for Step 1; ΔR^2 = .28 for Step 2 (ps < .001); ΔR^2 = .02 for Step 3 (ps < .05)			
* p < .05; **p < .01, *** p < .001			

Table 6: Hypothesis 7 Summary of Hierarchical Regression Analysis for Variables Predicting Length of Interruption.

Variable	B	SE B	β
Step 1 Morning Mood	-.29	.08	-.23**
Step 1 Morning Mood Dummy	-.11 -1.23	.11 .57	-.09 -.18*
Step 2 Morning Mood Dummy Helpful/Harmful	.00 -1.28 .60	.10 .53 .12	.00 -.19* .36***
Note: R^2 = .05 for Step 1; ΔR^2 = .24 for Step 2 (ps < .01): ΔR^2 = .10 for Step 3 (ps < .001) * p < .05; **p < .01, *** p < .001			

Table 7: Hypothesis 9 Summary of Hierarchical Regression Analysis for Variables Predicting Emotional Reaction to Progress on the Interrupted Task.

Variable	B	SE B	β
Step 1 Morning Mood	.25	.08	.21**
Step 2 Morning Mood Dummy	.28 .22	.10 .54	.23** .03
Step 3 Morning Mood Dummy NGD/PGD	.34 .19 .60	.10 .51 .12	.28*** .03 .35***
Note: R^2 = .04 for Step 1; ΔR^2 = .28 for Step 2 (ps < .001); ΔR^2 = .08 for Step 3 (ps < .001) * p < .05; **p < .01, *** p < .001			

Table 8: Hypothesis 12 Summary of Hierarchical Regression Analysis for Variables Predicting NGD.

Variable	B	SE B	β
Step 1			
Morning Mood	-.00	.06	-.07
Step 2			
Morning Mood	-.10	.06	-.14
Dummy	.00	.32	.01
Step 3			
Morning Mood	-.01	.05	-.11
Dummy	.32	.29	.09
Length of interruption	.22	.04	.40***
Note: R^2 = -.00 for Step 1; ΔR^2 = .29 for Step 2 (ps < .001); ΔR^2 = .11 for Step 3 (ps < .001)			
* p < .05; **p < .01, *** p < .001			

Table 9: Hypothesis 13 Summary of Hierarchical Regression Analysis for Variables Predicting Need to Shuffle Remaining Tasks.

Variable	B	SE B	β
Step 1			
Morning Mood	.00	.09	.00
Step 2			
Morning Mood	.12	.11	.09
Dummy	.90	.58	.13
Step 3			
Morning Mood	.22	.09	.17
Dummy	.86	.50	.12
NGD/PGD	.97	.12	.51***
Note: R^2 = -.01 for Step 1; ΔR^2 = .33 for Step 2 (ps < .001); ΔR^2 = .19 for Step 2 (ps < .001)			
* p < .05; **p < .01, *** p < .001			

Chapter IV: Study 3

Hypotheses 1, 3, 10, 11 and 14 were tested with this experiment. Hypothesis 1 states that interrupted high complexity tasks will take longer to complete than low complexity tasks. This hypothesis was tested using the high and low conditions for complexity of the materials. H3 states that interruptions that induce negative emotion will result in longer time to complete the TIP. This hypothesis was examined by the anxiety condition. When interrupted, the content of the interruption was designed to prompt either high anxiety or low anxiety. H10 suggests that when controlling for the time devoted to the interruption, intrusions and distractions will result in an increase in the time to complete the TIP. H11 states that when controlling for the duration of the interruption, intrusions will result in significantly longer time to complete the TIP than will distractions. These hypotheses were tested by comparing time to completion for those subjects assigned to the intrusion condition with those assigned to the distraction condition. H14 predicts mediation by negative emotions on the interruptions-performance relationship. Emotions are expected to fully mediate the detrimental influence interruptions have on

performance. The components of the model that were tested in Study 3 are included in Figure 36.

Method

Study 3 is a laboratory study looking into causal relationships between interruption attributes and reactions to interruptions. The laboratory setting will allow me to gain additional insight into the causal mechanisms involved in interruptions attributes and their associated outcomes by providing the controlled situation necessary for causation assumptions to be tested. The study is a 2x2x2 within subjects design, complexity of materials (high complexity v. low complexity), emotion (high v. low anxiety) and type of interruption (intrusion v. distraction). Two control conditions were also included, one for high and one for low complexity with no interruption.

Subjects

Subjects were 350 undergraduate business majors at the University of Washington Business School enrolled in an introductory Organizational Behavior class. Subjects participated to receive partial course credit for their OB class. Of the 350 subjects, 12 did not provide enough information and two others continued working on the materials after the experiment had ended (I only had

complete control of entry to the room for one hour). These 14 people were removed from the analyses resulting in 336 subjects with useable data.

An additional 25 subjects helped with creating the experimental materials prior to the beginning of data collection. They provided information on the clarity of the instructions and materials. Their input led to the inclusion of color to the instructions page to help subjects focus in on the example email they were provided.

Measures and Procedure

Subjects signed up to participate in the study to fulfill partial requirement for class credit and were randomly assigned to experimental conditions. The experiments occurred at the same time each weekday and lasted for 60 minutes. Subjects arrived at the experiment room 5 minutes before the experiment began, were seated in front of computers, and asked to read and agree/not agree to the informed consent form. All experimental materials were accessed via a link from the informed consent form and were computerized. Any subjects who arrived at or after the scheduled time were not allowed access to the room and were told to sign up for another day.

To induce feelings of realism, the subjects were informed that the exercises were similar to ones they could experience in an assessment center used to determine a person's management potential. Once they had agreed to participate, subjects were presented with both the PANAS (Watson, Clark, & Tellegen, 1985) and Affect Intensity (Larsen & Diener, 1987) questionnaires to control for trait affect. They were then presented with the FACES (Kunin, 1985) questionnaire to ascertain their current emotional state. Once they had completed the affect questions, they moved to the next screen where they were presented with instructions. It was at this point that I would leave so as to remove any possible interruption emanating from my movements in the room. I did leave the door to the room cracked so I could keep watch on their progress by looking over their shoulders at the computer screens. To induce feelings of urgency, the instructions informed them that they had 30 minutes to complete the in-basket exercises. The screen that followed the instructions included an organizational hierarchy chart showing them where they were in the organization. Below the chart, they received eight email in-basket messages that varied in complexity depending on the condition to which they were assigned. Using the materials validated by Barclay & York (1999),

the email messages were divided into conditions based on the importance of the message such that the more important messages were included most often in the high complexity condition and the trivial messages were included most in the low complexity condition. An example email for the high complexity condition is, "Thanks so much for your support. I'm worried that I might get fired. You know I cannot afford to quit before I've found another job. If you hear of any opportunities, please let me know." An example email for the low complexity condition is, "Our copier is down for repairs until the new parts come in. I have arranged with Emily to use the other copier—be sure to record copies for expense tracking." The high complexity condition required more interpersonal, relationship-based responses and the low complexity condition often required no response or a quick message regarding mainly task related information.

The subjects were instructed to read through each of the emails and then decide which email they would answer 1st, 2nd, 3rd, etc. based on the importance of the message. They then worked through each email in the order they had chosen stating how they would deal with the email (as some of them required no response whatsoever) rather than simply answering them. At the end of the

emails, they were then again presented with the FACES questionnaire with respect to their current emotional state. Following the FACES, they were asked a series of manipulation check questions, debriefed, and thanked for participating.

During the emails section of the experiment, the subjects either received an intrusion or distraction with the affect-inducing information. The intrusion occurred by entering the room and gaining the attention of either the entire room of subjects (only when I had groups of 4 or less). The distraction occurred by intruding upon one person in the room and speaking loudly enough for the remaining subjects to hear the interruption and by including information in the interruption that was relevant to those being distracted. The data from the person intruded upon was included along with the data from subjects in the all intrusion manipulations. The intrusions and distractions occurred for the same length of time (one minute). The content of the intrusion included the manipulation for the high v. low anxiety conditions. In the high anxiety condition, subjects were told, "As you may know, I am a doctoral student, and my dissertation committee likes to check up on me when I am running a study. They are currently meeting just down the hall, and they would like for one person to come down to

their meeting and give them around a 5-minute presentation on how you chose your strategy for answering the emails. You know, what made you decide which one to answer 1st, 2nd, 3rd, etc. They only need one person right now, but they may need others (used for the distraction conditions). I'm going to go check with them to see if they are ready for you yet. I'll be back to get you in a moment. Just keep in mind what your strategy is as you work through the emails. If you happen to finish before I get back, just wait for me in the hallway." In the low anxiety condition, subjects were told, "As you may know, I am a doctoral student, and my dissertation committee likes to check up on me when I am running a study. They are currently meeting just down the hall, and they would like for me to collect some information from you about how you chose your strategy for answering the emails. You know, what made you decide which one to answer 1st, 2nd, 3rd, etc. They only want the information from one person right now, but they may want me to collect it from others as well (used for the distracted subjects). Just keep in mind what your strategy is as you work through the emails. When you are finished, just come outside the room, and let me know what your strategy was." At this point, I would again leave the room and not reenter the room until after

every subject had left. As subjects finished and left the experiment, I was available for further debriefing as deception was involved. I checked with each person as they left to make sure they understood that the interruption was the experimental manipulation and that I regretted deceiving them.

Subjects were assigned to one of ten conditions. Two of the conditions were control conditions where they experienced either high or low complexity materials depending on the condition. The remaining eight conditions consisted of the following:

- Condition 1: high complexity, high anxiety, intrusion
- Condition 2: high complexity, low anxiety, intrusion
- Condition 3: high complexity, high anxiety, distraction
- Condition 4: high complexity, low anxiety, distraction
- Condition 5: low complexity, high anxiety, intrusion
- Condition 6: low complexity, high anxiety, distraction
- Condition 7: low complexity, low anxiety, intrusion
- Condition 8, low complexity, low anxiety, distraction

Statistical Analysis

Performance was measured using two accuracy scores, one for their answers and one for their ranking of the emails (the order

in which they would be answered). I rated their answers using a 5-point Likert-type scale (1 = not at all correct, 5 = completely correct). These two scores were not significantly different for any of the conditions. The third measure of performance was time to completion. The computer program used collected beginning and ending time for each subject. I recorded the time devoted to the interruptions and subtracted that to produce their overall time to completion. For all subjects, this time was approximately one minute (50-60 seconds). This score was used in all analyses as the dependent variable for performance. In pre-testing, I attempted to control for time before the interruption by not allowing any subjects to begin the in-basket exercises until everyone had completed the affect questionnaires. This resulted in several subjects waiting for extended periods of time during which they began to become bored and would open email or surf the Internet. Rather than repeatedly stopping them (some would go back to emailing as soon as I walked away), I decided to wait to interrupt until all had at least started the in-basket exercises. This decision randomized where they were in task completion when interrupted.

The data was analyzed using Analysis of Covariance (ANCOVA) to test for main effects of the manipulated variables. The PANAS and affect intensity scales were entered as covariates.

Assumption Checks

The data were first checked for assumption violations. The normality assumption was checked using Kolmogorov-Smirnov and the Shapiro-Wilk tests. For each of the conditions, the tests showed no departure from normality (see Table 9). Homogeneity of Variance assumptions were checked using the Levene Statistic. Based on the Mean, HOV assumptions were violated Levene(9,324) = 2.03, *p*. = .036 (see Table 10). A natural log transformation was conducted on the dependent variable (Time), and variances changed to within acceptable range Levene(9, 324) = 1.15, *p*. = .329 (see Table 11). All hypothesis tests were conducted on the transformed dependent variable. The control variables had different scales, and as such they were normalized prior to data analysis.

Results

Hypothesis 1 states that interrupted high complexity tasks will take longer to complete than low complexity tasks. This was significant $F(1, 332) = 8.44$, $p. < .01$. While this finding may seem obvious, it was helpful as a manipulation check to see that high complexity conditions took significantly longer to complete than did the low complexity conditions. Additionally, I conducted the same test on the control conditions and again found that high complexity tasks took significantly longer to complete than low complexity tasks $F(1,70) = 7.64$, $p. < .01$. To further explore this relationship, interactions with anxiety and intrusion/distraction were tested. Neither interaction was significant $F(1,247) = .43$, n.s. and $F(1, 247) = .00$, n.s., respectively.

Hypothesis 3, negative emotion (high anxiety condition) induced by being interrupted will result in longer time to complete the TIP, when controlling for beginning of survey mood state and when compared with the low anxiety condition, was supported $F(1, 246) = 4.74$, $p. < .05$ suggesting that negative emotion lowers performance. This finding provides support for the contention that the content of the interruption can have an effect on subsequent performance. Additionally, I tested for an interaction between

anxiety and complexity and between anxiety and interruption/distraction. Anxiety x complexity was not significant $F(1, 244) = .30$, n.s. The anxiety x the intrusion/distraction manipulation was significant $F(1, 244) = 6.34$, $p. < .05$ suggesting that the distraction has less of an effect on time to completion when anxiety is low as opposed to when anxiety is high, yet high anxiety leads to a lengthy time to completion regardless of type of interruption (see Figure 37).

H10 states that there will be a difference between the interruptions and distractions manipulations and the controls after controlling for the time devoted to the interruption. Each condition was compared against its control. Conditions 1-4 were the high complexity conditions. Condition 1, high complexity, high anxiety, interrupt was significant $F(1, 74) = 11.34$, $p. < .01$. Condition 2, high complexity, low anxiety, interrupt was significant $F(1, 74) = 6.68$, $p. < .05$. Condition 3, high complexity, high anxiety, distract also was significant $F(1, 70) = 4.87$, $p. < .05$. Condition 4, high complexity, low anxiety, distract failed to reach significance $F(1, 71) = .49$, *n.s.* Conditions 5-8 were the low complexity conditions. Condition 5, low complexity, high anxiety, interrupt was significant $F(1, 64) = 34.13$, $p. < .001$. Condition 6, low complexity, high

anxiety, distract was also significant $F(1, 63) = 28.98$, $p. < .001$. Condition 7, low complexity, low anxiety, interrupt was significant $F(1, 58) = 36.20$, $p. < .001$. Condition 8, low complexity, low anxiety, distract reached significance at the .10 level $F(1, 59) = 3.67$, $p. = .06$. This suggests that, overall, interruptions (intrusions or distractions) result in an increase in time to complete the interrupted task even when controlling for the time devoted to the interruption. Interestingly, even though condition 4 (High Complexity, Low Anxiety, Distraction) failed to reach significance, when comparing the conditions against their controls, a one-minute interruption resulted in lost productivity time. Comparing median times to completion, conditions where intrusions occurred lost the most time: 8.06 minutes for high complexity and 8.80 minutes for low complexity. Distractions were not as disruptive: 1.28 minutes for high complexity and 5.21 for low complexity. Interestingly, low complexity conditions lost more time than the high complexity conditions.

Hypothesis 11 compares intrusions to distractions stating that intrusions will result in longer time to complete the TIP than will distractions when controlling for the time devoted to the interruption. This was significant $F(1, 229) = 10.89$, $p. < .01$

suggesting that actually stopping the TIP results in more time expended on completing the interrupted TIP than does a distraction during which the individual can divide his or her attention between working on the TIP and the distracting stimuli.

Post Hoc analyses on the manipulation check items, complexity, anxiety, distraction and work harder found no differences in perceived complexity, anxiety or desire to work harder as a result of the interruption. Using the Tukey post hoc criterion for significance $F(9, 236) = 5.16$, $p. = .000$, participants in condition 3 (High complexity, High anxiety, Distraction), reported being significantly more distracted by the interruption than those in conditions 8 (Low complexity, Low anxiety, Distraction; M = 97, SD = .28), 9 (Low complexity control; M = .77, SD = .25) and 10 (High complexity control; M = 1.01, SD = .27). Participants in condition 4 (High complexity, Low anxiety, Distraction) reported being significantly more distracted by the interruption than those in conditions 7 (Low complexity, Low anxiety, Interruption; M = .93, SD = .27), 8 (M = 1.20, SD = .28), 9 (M = 1.00, SD = .25) and 10 (M = 1.23, SD = .27). Participants in condition 6 (Low complexity, High anxiety, Distraction) reported being significantly more distracted than those in conditions 8 (M = .97, SD = .27), 9 (M = .98, SD =

.23) and 10 (M = 1.01, SD = .25). These tests suggest that the distraction manipulation worked best when at least one other manipulation was present, and suggests that intrusions were not considered distracting, providing support for the conceptual difference between intrusions and distractions.

Mediational Analysis

Hypothesis 14 states that emotions will mediate the relationship between the interruption and performance. This hypothesis was tested following the procedures in Baron and Kenny (1986). In the mediational analysis, the independent variable was the interruption (intrusion or distraction) of the task in progress. The dependent, performance, variable was the subject's overall time to completion, and emotion was operationalized by the anxiety manipulation. As expected, the interruption was a significant predictor of the dependent variable of interest, time to completion (β = .30, $p < .001$). Interruption also significantly predicted negative emotion (anxiety; β = .83, $p <$ .001). Emotion significantly predicted time to completion (β = .31, $p <$ .001), and finally, when entered simultaneously in the regression equation, Interruption fell to a non-significant level, and the Beta level fell to approximately zero (β = .13, n.s.) while Emotion remained

significant ($\beta = .31$, $p < .05$). The above would then suggest full mediation (see Figure 38).

Discussion

Study 3 focused on performance outcomes in a highly controlled environment. This study tested the complexity (H1) of the materials (as opposed to the complexity of the interrupting materials) using email in-basket exercises designed for use by management students taking the role of managers. When complex tasks are interrupted, the participants took significantly longer to finish the in-basket exercises than when the tasks were less complex. This is in line with previous theorizing on the influence of straining working memory by introducing interruptions when one is cognitively engaged (Rogelberg, Desmond, Warr, & Burnfield, 2006; Rudolph & Repenning, 2002; Zijlstra, Roe, Leonora, & Krediet, 1999). Although there was no significant difference found in the manipulation checks when asked if the task was complex, as this was a between-subjects design, the participants may have underestimated the complexity of their tasks as they had no comparison.

Negative emotion (in the form of anxiety), when induced by an interruption was significantly related to time to complete the TIP.

This main effect was, however, negated by the presence of an interaction between anxiety and interruption type. High anxiety, regardless of distraction or intrusion resulted in essentially the same lengthy time to complete the TIP. Low anxiety, when individuals were distracted resulted in a quicker time to complete the TIP than those intruded upon with low anxiety-inducing information. The low anxiety, intrusion interaction raised the time to completion to essentially the same level as the high anxiety, intrusion/distraction level. This finding provides some additional support for the emotion findings in Study 2. Negative emotions appear to have precedence (Frijda, 1993) over other influences on task progress.

In all conditions except condition 4 (high complexity, low anxiety, distraction) it took significantly longer for subjects to complete the in-basket exercises when interrupted or distracted than those in the control conditions (H10). The non-significance of condition 4 may be due to the strength of the complexity manipulation and the relative weakness of the low anxiety and distraction manipulations. As was mentioned above, negative emotion may be the driving force behind a lack of task progress. However, it is also possible that the low anxiety information failed to

produce any anxiety and therefore did not distract them away from the complex task at hand. Additionally, when comparing the differences in median times to completion, a one-minute interruption resulted in 8.06 minutes for high complexity/intrusion, 8.80 minutes for low complexity/intrusion, 1.28 minutes for high complexity/distraction and 5.21 for low complexity/distraction suggesting that even with weak manipulations and controlling for the one-minute interruption itself, any interruption will result in lost productivity time above and beyond the time dedicated to the interruption. The increased completion time for the low complexity conditions may be have resulted from task boredom such that a window of opportunity was opened for a mental break from the task.

The test of hypothesis 11 compared intrusions to distractions stating that intrusions would result in longer time to complete the TIP than will distractions when controlling for the time devoted to the interruption. As was expected, this finding was significant. Intrusions require a pause in the TIP whereas unless the incoming stimuli overload working memory, distractions do not necessarily stop progress on the TIP (Jett & George, 2003). Additionally, distractions may need to cross a certain threshold in order to

become distractions. As with noise outside one's office, the noise may need to be either excessively loud or occur for an excessively long time before it becomes a distraction that impacts a person's performance. In the post hoc analyses, subjects in the High complexity, High anxiety, Distraction (3); High complexity, Low anxiety, Distraction (4); Low complexity, High anxiety, Distraction (6) conditions rated the interruption by the researcher as significantly more distracting than those in the control conditions or the Low complexity, Low anxiety, Distraction (condition 8), and participants in condition 4 also found the researcher's interruption to be significantly more distracting than those in the Low complexity, Low anxiety, Interruption (condition 7). From these analyses, it would appear that the likelihood of perceived distractions increase as complexity and anxiety increase. Additionally, these analyses provide some support for the effectiveness of the distraction manipulation, showing a distinction between intrusions and distractions.

Hypothesis 14 was also supported. Emotions were found to mediate the relationship between interruptions and performance, providing preliminary support for the theoretical model.

Limitations

The manipulations were relatively weak. A stronger test of the negative emotion-performance link would have been helpful. As it was, anxiety did show some connection to performance, yet an emotion such as anger would most likely result in a stronger relationship with performance. The complexity manipulation of the materials was also not as dichotomized as it could have been. The materials were more or less complex rather than complex v. simple. In light of the weak manipulation, the significant findings provide support for the strong influence that interruptions have on task performance. The intrusion v. distraction manipulation also suffered from a weak manipulation. It is highly likely that intrusions are problematic simply because they must be dealt with as they happen whereas distractions may build in intensity before they actually have a strong influence on performance. Additionally, dealing with intrusions and distractions calls upon different resources within the person. While both can put a strain on working memory, intrusions require a stoppage of work progress requiring the individual to keep in working memory where he or she was in the progress and what the content of the striving entailed. A distraction, however, takes resources away from working memory

during the process of goal striving, but only if the distraction is of a similar type as the task in progress. This suggests that comparing the two types of interruptions may not be advisable as they are each distinct in their orientation, influence on cognitive load, and resultant outcome. Intrusions are external, typically unexpected interruptions that demand a pause in task striving whereas distractions do not require that the task striving come to a halt while attending to the distraction (Jett & George, 2003).

Individual difference variables were also not accounted for in this study. The use of randomization should have rectified any problems that may have occurred as a result of this exclusion, though it would be helpful to include several individual difference variables in the future.

Finally, this study suffers from the same limitations of any experimental lab study conducted with undergraduate business students. The findings may not generalize to other areas, though, in combination with Study 2, several of the findings provided a support for the field study as well as giving a finer-grained understanding of the mechanisms involved in the interruptions-performance link.

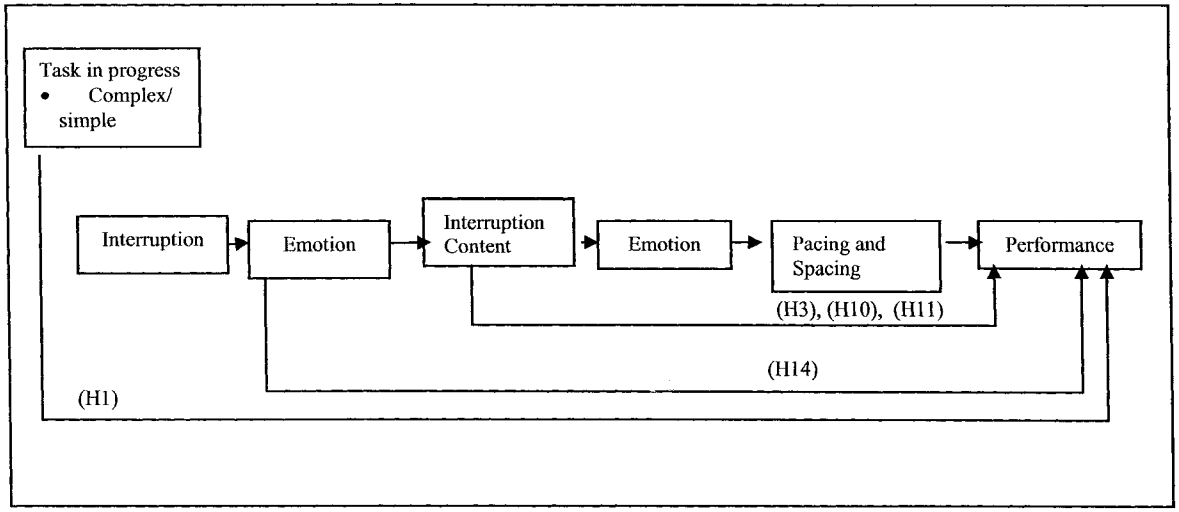


Figure 36: Study 3 Tested Model

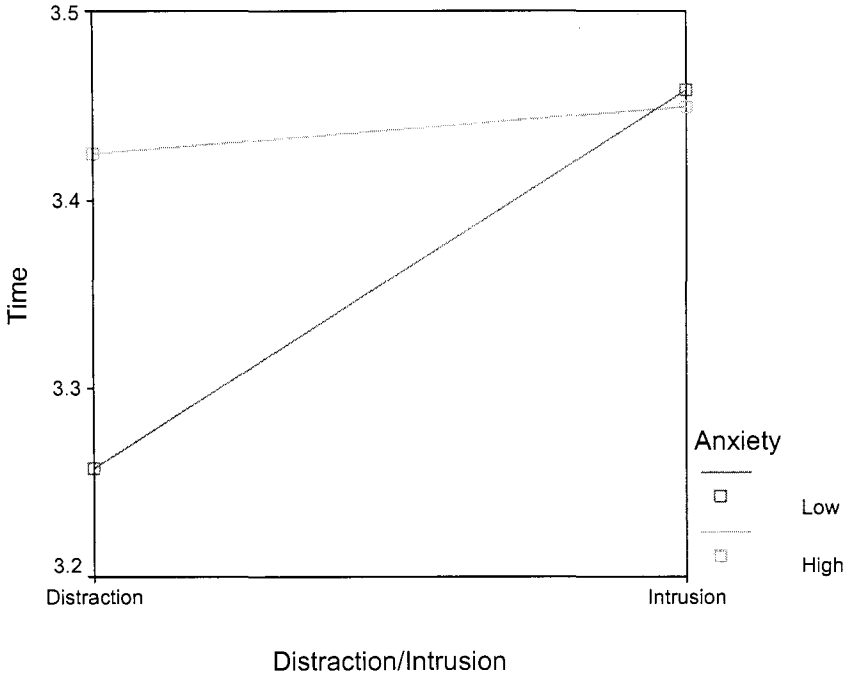
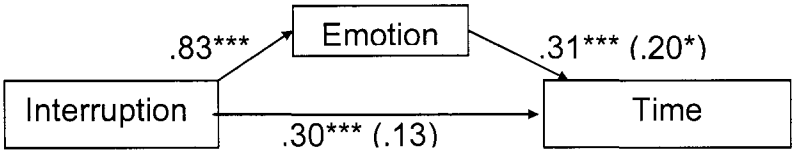


Figure 37: Moderation Analysis



The standardized regression coefficients Interruptions and Performance controlling for emotion is in parenthesis.
*p. < .05; ***p. < .001

Figure 38: Hypothesis 14 Mediation Analysis

Table 9: Tests of Normality

		Kolmogorov-Smirnov			Shapiro-Wilk		
	COND	Stat	df	Sig.	Stat	df	Sig.
TIME	1 High C High A Interrupt	.147	35	.055	.952	35	.220
	2 High C Low A Interrupt	.127	34	.180	.955	34	.288
	3 High C High A Distract	.153	27	.103	.939	27	.147
	4 Hich C Low A Distract	.128	30	.200*	.958	30	.375
	5 Low C High A Interrupt	.083	34	.200*	.982	34	.879
	6 Low C High A Distract	.143	31	.110	.965	31	.466
	7 Low C Low A Interrupt	.124	29	.200*	.974	29	.708
	8 Low C Low A Distract	.141	31	.118	.964	31	.461
	9 Low C Control	.122	35	.200*	.956	35	.291
	10 High C Control	.092	48	.200*	.977	48	.607

Table 10: Test of Homogeneity of Variance for Time

		Levene Statistic	df1	df2	Sig.
Time	Based on Mean	2.030	9	324	.036
	Based on Median	1.559	9	324	.126
	Based on Median and with adjusted df	1.559	9	283.452	.127
	Based on trimmed Mean	1.963	9	324	.043

Power for transformation = .424

Table 11: Test of Homogeneity of Variance for log of Time

		Levene Statistic	df1	df2	Sig.
Time	Based on Mean	1.146	9	324	.329
	Based on Median	.904	9	324	.522
	Based on Median and with adjusted df	.904	9	266.516	.522
	Based on trimmed Mean	1.049	9	324	.400

Chapter V: Summary and Conclusions

These three studies give a more complete picture of the interruptions sequence, though not a complete one. The remaining parts of the model as yet untested at the end of these studies will be examined after the dissertation is complete. The first two studies are descriptive in their approach and focused on gaining a clearer understanding of the interruptions that have the largest impact on emotions and performance. The third study was able to build upon the first two and provided a controlled environment in which I could further examine the relationships (see Table 12 for a summary of the findings).

Differences between the studies likely account for the differences in the overall findings. Study 1 focused on the most salient interruptions experienced over the subjects' working tenure. Study 2 focused on interruptions that occurred each day within approximately 30 minutes of taking the survey, and Study 3 used the controlled nature of the laboratory to immediately test reactions to being interrupted. It is highly likely that the interruptions most salient to the participants in Study 1 were those from outside the workplace. When recalling interruptions from a variety of jobs, and

in response to the questions asked (what interruptions made it most difficult to return to work or most angry) it is entirely plausible that the instances most easily brought to mind are those that are consistent across settings such as those from one's friends and family. Study 2, in contrast, did not allow the participant to choose which interruption they found most salient but rather asked for their reaction to whatever type of interruption they experienced that day. As such, the time dimension difference and the difference in what the participant recalled due to the types of questions asked in each study were most likely what influenced the inconsistent findings between the two studies.

Studies 1 and 2 also differed with respect to the type of tasks that were interrupted. Study 1 included subjects from any number of different jobs and industries while all the subjects in Study 2 worked in secretarial positions on the University of Washington campus. The types of tasks interrupted, therefore, are most likely vastly different between the two groups of participants. One final difference between the studies is the types of questions asked. Study 1 only collected information on negative emotions emanating from interruptions. Study 2 allowed for any emotion to be indicated

on a Likert scale, and Study 3 induced negative emotion in the high anxiety conditions.

Overall, the main theoretical model was supported, though I would suggest that it is best supported when considering intrusions. Intrusions lead to cognitive appraisals and emotions that influence work productivity. Complexity of the interrupted task was found to influence work productivity. This hypothesis, while seemingly obvious, was helpful in more completely explaining the influence that the task has on reactions to interruptions. If individuals at work have tasks that are more complex than others, it may benefit them to plan accordingly and work on complex tasks either when they can control the interruptions (such as by closing their office door) or during times of day when their main interrupters are less likely to intrude (such as when the boss is in a meeting). Additionally, the finding that the low complexity tasks in the third study, when interrupted, resulted in a longer median time to completion than the high complexity tasks suggests that task boredom needs to be considered whenever performance effects of interruptions are studied.

Study 1 suggested that interruptions from friends and family sources were very disruptive and produced negative emotion.

Study 2 failed to provide support for that finding. These contradictory findings may have been due to the time dimension of the question mentioned above. Another potential influence on these findings is the individual's job satisfaction. When supervising an undergraduate student's research project on interruptions, we learned from a qualitative study (N = 10) that people who stated that they did not like their jobs and or bosses were happier to receive interruptions from friends and family. People who stated that they liked their jobs (or were not allowed to accept calls from home except in emergency situations) were more irritated by interruptions from friends and family while at work. This finding will definitely be examined more closely in future studies. Additionally, chat unrelated to work was mentioned as particularly distressing in Study 1 but received no support in Study 2. As was mentioned above, this may be a result of job satisfaction issues, job boredom issues or a gender issue. All but one of the subjects in Study 2 were women, so it is possible, as women tend to be more communal than men (Deaux, & Kite, 1993), that this lack of support is due to a gender influence.

Where in the task one is when interrupted failed to result in any reactions. As was mentioned above, it is possible that the

subjects do not work on cognitively complex tasks, and as such, do not need to hold large amounts of information in working memory similar to the low complexity findings of Zijlstra et al. (1999). Additionally, the finding that being interrupted early results in more negative emotion than being interrupted later in the task progress appears to be less influenced by the hypothesized "pull" effect of nearing a goal deadline and more influenced by a similar "pull" effect of starting goal striving. Once a goal has been accepted, initiating goal striving is the next step in the process of attaining the goal. Should the striving be hindered by an interruption, a negative emotional reaction could be expected. Should the completion of a goal be hindered by an interruption, however, the emotional reaction was found to be not be as great due to the time need created by the interruption (for example, finding another 10 minutes to complete the task would be considerably simpler than finding another 50 minutes to even begin the task).

Most promising of the findings is the support for the NGD-negative emotion link and the negative emotion-productivity link. Both studies 2 and 3 supported this path in the theoretical model. Interruptions and distractions that put a person behind in their work influence negative emotions. These negative emotions then

negatively influence task productivity. As was suggested by Jett and George (2003) and Interruptions Theory (Mandler, 1989), not all interruptions will result in negative emotions, though as these studies have shown, those that do impact performance outcomes significantly. Negative emotional reactions are more likely than positive as interruptions, and often result in individuals falling behind in their goal progress. Goal striving does not happen in a vacuum, and this dissertation provides an interesting examination of some of the outcomes experienced when interruptions to goal striving occur.

Future Research

While these studies have provided some interesting findings, this is truly the beginning of a richly detailed area of study. Future research should focus on those individual differences that are expected to interact with interruptions the most. For example, an extravert may have more difficulty screening out distractions initiated by others in the office yet may have no problem screening out distractions initiated by loud construction noises outside his or her office window. Someone with trait procrastination may be most effective when interruptions put him or her in a negative goal discrepancy situation, yet that same person may be influenced to

procrastinate whenever a positive goal discrepancy occurs. Other factors such as job satisfaction, job boredom, or even P-J fit may influence reactions to interruptions and should be included in future research on the subject.

Attributes of the interruption need to be more fully examined. For example, if the interruption is beneficial to the person yet not beneficial to the task (or tasks), will the individual have a more negative or positive emotional reaction? Will performance suffer more or less? People who work at computers all day have multiple opportunities to be interrupted by email and instant messages. How do these electronic interruptions differ from face to face interruptions? As more and more workers spend their working lives in front of computers, and as many people in offices use their intranet to communicate rather than physically enter each other's offices, this is a particularly important question to answer.

The study of interruptions will provide a very rich focus of inquiry, and gaining as clear an understanding of processes that derail goal striving as we have on the goals sequence itself will prove extremely beneficial to both organizational researchers and practitioners.

Table 12: Summary of Findings

Interruption Components	Emotions	Performance Outcomes
Interruption vs. no interruption	Not tested	Study 3: Longer time to completion of TIP
Who interrupts	Study 1: Friends and Family (-) Organization (+) Study 2: Friends and Family (+) Organization (-)	Not tested
Helpful/harmful	Study 2: Harmful (-)	Study 2: Interruption duration took longer when harmful
Timing	Study 2: Interrupt near commencement (-) Interrupt near completion (+)	Study 2: No difference
Chat unrelated to work	No difference	Not tested
NGD/PGD	Study 2: NGD (-)	Study 2: NGD - More need to shuffle remaining tasks

Table 12: (continued)

Interruption Components	Emotions	Performance Outcomes
Complex task	Not tested	Study 3: Overall longer time to completion when complex Low complexity condition – longer median time to completion than high complexity Intrusions – longer median time to completion than distractions
Negative emotion	(-)	Study 2: No effect on interruption duration Study 3: Longer time to completion when anxiety was induced
Intrusions vs. Distractions	Not tested	Study 3: Longer time to completion for intrusions

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Appendix A: Workplace Interruptions

Thank you for agreeing to take part in this survey. This survey is designed to gain information on interruptions you have experienced during your workday. Responses will be combined with all the others and used to create surveys in the future. For the items below, please circle all that apply.

While working, I have been interrupted by:

- telephone calls
  a. from family
  b. from friends
  c. from co-workers
  d. from my boss
  e. from my subordinates
  f. from other colleagues
  g. other:_____
     _____
     _____
     _____

- instant messages
  a. from family
  b. from friends
  c. from co-workers
  d. from my boss
  e. from my subordinates
  f. from other colleagues
  g. other:_____
     _____
     _____
     _____

- emails
  a. from family
  b. from friends
  c. from co-workers
  d. from my boss
  e. from my subordinates

f. from other colleagues
g. other:_____
_____
_____
_____

- my boss stopping by
  a. for a chat
  b. to assign new work
  c. to ask for help with a task
  d. to discuss my progress on a task
  e. other:
  _____
  _____
  _____
  _____

- my co-worker stopping by
  a. for a chat
  b. to ask for help with a task
  c. for help with a personal problem
  d. for help with a professional problem
  e. other:
  _____
  _____
  _____
  _____

- my subordinate stopping by
  a. for a chat
  b. to give me completed work
  c. to ask for more work
  d. for help with a personal problem
  e. for help with a professional problem
  f. to ask for help with a task
  g. other:
  _____
  _____
  _____
  _____

Other types of interruptions I have experienced while working:

_____
_____
_____
_____
_____
_____
_____

Please take a moment to consider the previous times you have been interrupted while working.

Which interruptions made it difficult to return to work?

- telephone calls
  a. from family
  b. from friends
  c. from co-workers
  d. from my boss
  e. from my subordinates
  f. from other colleagues
  g. other:_____
     _____
     _____
     _____

- instant messages
  a. from family
  b. from friends
  c. from co-workers
  d. from my boss
  e. from my subordinates
  f. from other colleagues
  g. other:_____
     _____
     _____
     _____

- emails
  a. from family
  b. from friends
  c. from co-workers

d. from my boss
e. from my subordinates
f. from other colleagues
g. other:_____
_____
_____
_____

- my boss stopping by
  a. for a chat
  b. to assign new work
  c. to ask for help with a task
  d. to discuss my progress on a task
  e. other:
  _____
  _____
  _____
  _____

- my co-worker stopping by
  a. for a chat
  b. to ask for help with a task
  c. for help with a personal problem
  d. for help with a professional problem
  e. other:
  _____
  _____
  _____
  _____

- my subordinate stopping by
  a. for a chat
  b. to give me completed work
  c. to ask for more work
  d. for help with a personal problem
  e. for help with a professional problem
  f. to ask for help with a task
  g. other:
  _____
  _____

Other types of interruptions I have experienced while working that made it difficult for me to return to work:

Which interruptions made you most angry?

- telephone calls
  a. from family
  b. from friends
  c. from co-workers
  d. from my boss
  e. from my subordinates
  f. from other colleagues
  g. other:

- instant messages
  a. from family
  b. from friends
  c. from co-workers
  d. from my boss
  e. from my subordinates
  f. from other colleagues
  g. other:

- emails

a. from family
b. from friends
c. from co-workers
d. from my boss
e. from my subordinates
f. from other colleagues
g. other:_____
_____
_____
_____

- my boss stopping by
  a. for a chat
  b. to assign new work
  c. to ask for help with a task
  d. to discuss my progress on a task
  e. other:
  _____
  _____
  _____
  _____

- my co-worker stopping by
  a. for a chat
  b. to ask for help with a task
  c. for help with a personal problem
  d. for help with a professional problem
  e. other:
  _____
  _____
  _____
  _____

- my subordinate stopping by
  a. for a chat
  b. to give me completed work
  c. to ask for more work
  d. for help with a personal problem
  e. for help with a professional problem
  f. to ask for help with a task
  g. other:
  _____

Other types of interruptions I have experienced while working that made me most angry:

If there are any other interruptions you have experienced that are not included above, but that impeded your progress on a task, please include them below.

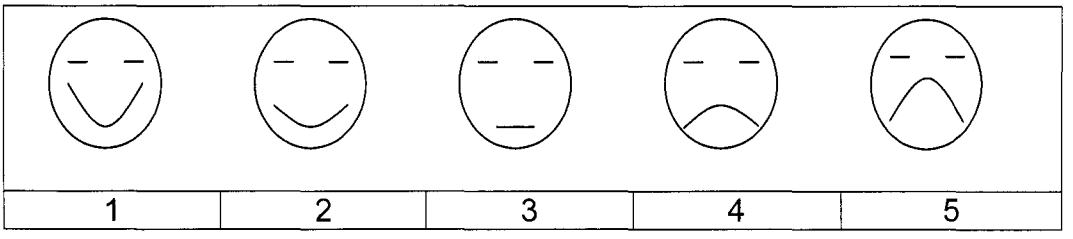
Thank you very much for assisting us with our survey creation.

Appendix B: Event Sampling Study

Thank you for taking part in the online survey.

Below you will find questions regarding interruptions and your reactions to being interrupted. We appreciate your answers to these questions. Any information you provide is completely confidential.

Question 1:
Please click on the face that corresponds with your mood when you arrived at work this morning.



The following questions refer to the last time you were interrupted today.

Question 2
Approximately how long ago were you interrupted in hours and minutes?

Question 3
What is the position of the person who interrupted you in relation to your position?
My family member
My co-worker
My supervisor
My friend
My subordinate
Other

Question 4
Was the interruption related to work?
Yes

No

Question 5
Were you working on a specific task or project when you were interrupted?
Yes
No

Question 6
Did the interruption include new work to be completed immediately?
Yes
No

Question 7
If yes, please click on the item that corresponds most closely with how you felt about having to stop working on one task to complete the interrupting task.
Extremely happy
Somewhat happy
Neither happy nor unhappy
Somewhat unhappy
Extremely unhappy
N/A

Question 8
Did the interruption include chat unrelated to work?
Yes
No

Question 9
If yes, please click on the item that corresponds most closely to how it made you feel to be interrupted with unrelated chat.
Extremely happy
Somewhat happy
Neither happy nor unhappy
Somewhat unhappy
Extremely unhappy
N/A

Question 10
Approximately how long did the interruption last?

Question 11
Please click on the item that most closely corresponds to how you felt the moment you knew who it was that was interrupting you such as when you saw the person's face or heard his/her voice.
Extremely happy
Somewhat happy
Neither happy nor unhappy
Somewhat unhappy
Extremely unhappy
N/A

Question 12
Please click on the number that most closely corresponds to where you were in the progress of working on the interrupted task.
Just started
25% Complete
50% Complete
75% Complete
Almost finished
N/A

Question 13
Please indicate on the following scale how helpful or harmful the interruption was to completing the task you were working on.
Extremely harmful (May have caused you to start the task over)
Somewhat harmful (Delayed your progress)
Neither helpful nor harmful
Somewhat helpful (Put you a little ahead on the task)
Extremely helpful (Allowed you to complete the task early)
N/A

Question 14
Please click on the item that most closely corresponds to how you feel about having been interrupted.
Extremely happy
Somewhat happy
Neither happy nor unhappy
Somewhat unhappy
Extremely unhappy

Question 15
Considering the task you were working on when interrupted, did the interruption put you
Very behind schedule
Somewhat behind schedule
No difference
Somewhat ahead of schedule
Very ahead of schedule
N/A

Question 16
Please click on the item that most closely corresponds to how you feel about your progress on the interrupted task.
Extremely happy
Somewhat happy
Neither happy nor unhappy
Somewhat unhappy
Extremely unhappy
N/A

Question 17
Please indicate the extent that the interruption caused you to shuffle around your other tasks for the day.
Not at all
Hardly at all
A little bit
Somewhat
To great extent
N/A

Thank you for taking part in this survey.

VITA

The author received her BA from Southern Illinois University, Carbondale. Her research interests include workplace conflict, turnover, sustainability and alternative organizational structures.