

THE LINGERING EFFECTS OF MULTI-TASKING  
ON AUDITORS' JUDGMENT QUALITY

by

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A DISSERTATION

Submitted in partial fulfillment of the requirements  
for the degree of Doctor of Philosophy  
in the School of Accountancy  
in the Graduate School of  
The University of Alabama

TUSCALOOSA, ALABAMA

2015

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## ABSTRACT

Auditors must frequently multi-task in order to complete audit tasks efficiently, but the potential negative impact of multi-tasking on auditors' judgment quality is poorly understood. In this study, I address this issue and provide evidence that multi-tasking depletes auditors' ability to maintain cognitive focus, resulting in an impaired ability to identify seeded errors, particularly conceptual errors, during a subsequent workpaper review task. Importantly, this negative consequence is mitigated when auditors are exposed to an intervention based on a theoretical countermeasure (positive affect) designed to replenish decision makers' self-control resources. Given that multi-tasking is a pervasive feature of the current audit environment, and that depletion is expected to influence other complex audit tasks, these findings have direct implications for audit practice. Beyond identifying multi-tasking as a cause of impaired performance in auditing, this study's results provide initial evidence that such negative effects can be mitigated, resulting in improved judgment quality and, by extension, improved financial statement quality.

## DEDICATION

This dissertation is dedicated to my wife, Christina. Without your encouragement, patience, inspiration, and unwavering support, I could not have made it through even one year of the doctoral program. I thank you for helping me to keep perspective on what is important in life, for making me smile when I was discouraged, and for putting up with late nights at the office. I'll do everything I can to live out Ephesians 5:25. This dedication would be incomplete if I did not mention my son, Aidan. You have brought happiness to your mother and me that we will never be able to repay.

## ACKNOWLEDGEMENTS

I gratefully acknowledge the guidance of Rick Hatfield, my dissertation chair, in the development of this paper. I thank him for his advice, guidance, and support during my tenure as a doctoral student, which will continue to benefit me immensely throughout my academic career. I am also grateful for support from the other members of my dissertation committee: Kim Campbell, Rich Houston, Linda Parsons, and Marcus Perry. I thank the entire accounting faculty at The University of Alabama for the knowledge gained and advice received throughout my tenure as a doctoral student. I would also like to thank my fellow PhD students, current and former, for their support throughout my time in the program. I thank Ryan Dunn, Jasmine Bordere, George Ruch, and Chris McCoy for spending multiple hours helping me to compile the dissertation materials. Additionally I am grateful for the numerous helpful comments that have improved this manuscript, the many intellectual “arguments” that have pushed my knowledge and understanding of what I thought I knew, and the encouragement I needed to navigate the doctoral program, all of which came from my friends and comrades, Ben Commerford and George Ruch. Finally I thank the participating accounting firms for being generous with their time and expertise.

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## CHAPTER 1

### INTRODUCTION

This study examines how and why multi-tasking depletes auditors' self-control resources (i.e., the ability to maintain cognitive focus), resulting in lower quality judgments when completing subsequent tasks. Further, I consider the efficacy of an intervention designed to restore self-control resources and improve judgment quality. Multi-tasking is pervasive in auditing, and it is increasingly common given improvements in information technology that increase the frequency of and ease of access to information (Appelbaum et al. 2008). Prior studies have examined auditors' performance while multi-tasking, generally finding that auditors are susceptible to contrast or memory errors, which in turn causes an increased likelihood of confusing information related to one task with another task (e.g., Lindberg and Maletta 2003; Bhattacharjee et al. 2007). While these studies focus on performance *during* multi-tasking, I predict that multi-tasking will have a lingering negative impact on auditors' *subsequent* task performance. The research questions and related hypotheses are built upon the concept that decision makers have limited resources to perform cognitively demanding tasks (Schmeichel et al. 2003).

A series of experiments in psychology have demonstrated that cognitive resources expended in one task will influence an individual's will and/or ability to engage in further cognitively demanding thought (e.g., decision-making and reasoning) in subsequent tasks (see Hagger et al. 2010 for a meta-analysis of this literature). The basic premise of the underlying theory, referred to as Ego Depletion Theory, is that individuals "self-control" resources, which

allow them to maintain the focus necessary to override unwanted responses, actions, or behaviors in order to achieve a goal or avoid some outcome, are limited.<sup>1</sup> This theory applies to cognitive, physical, and emotional tasks since they rely on the same pool of self-control resources, such that effects on these resources (negative or positive) are influential across tasks and task type. For example, depletion of self-control resources in an emotional setting results in decision makers who are less able to engage in volitional processing and are more likely to rely on heuristic processing or “default” decision making (Muraven et al. 1999).

The audit environment includes numerous features that require, and likely deplete, auditors’ self-control resources (i.e., maintaining a questioning mind, critically assessing audit evidence, resisting the urge to accept the status quo.), making them especially susceptible to depletion effects (i.e., impaired judgment quality) (Hurley 2014). Of the many situations in a typical audit that could have a depleting effect on an auditor, I consider multi-tasking. While the amount of work required to complete an audit task likely is the same whether an auditor completes the task in a sequential or multi-tasking manner, psychology research suggests that multi-tasking requires auditors to expend an incremental amount of self-control resources.<sup>2</sup> Specifically, I consider two aspects of multi-tasking that cause depletion. First, individuals have a dispositional need for closure (Kruglanski and Webster 1996) and typically are compelled to complete a task that they have started, which makes switching to a new task, prior to completion

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<sup>1</sup> I refer to the depletion of self-control resources, and the related negative performance impact, as depletion. Prior research also has referred to the phenomenon as ego depletion or self-control depletion.

<sup>2</sup> It is important to note that psychology literature distinguishes depletion from fatigue (both mental and physical). Whereas fatigue results from incremental levels of activity, depletion results from incremental levels of self-control exertion. Accordingly, I do not vary the amount of work between conditions, but rather manipulate the self-control resources required by the experimental tasks. Accordingly, my expectations are a function of self-control depletion, not fatigue.

of the first, taxing on self-control resources (Heath et al. 1999). Second, task switching requires cognitive focus in order to shift goals and activate new decision rules that may be required for a different task (Rubenstein et al. 2001). Consequently, multi-tasking is a theoretically compelling context in which to test depletion theory in auditing.

Given that auditors work in an environment in which multi-tasking is virtually certain to occur, it is important to note that depletion research indicates that self-control resources can be replaced. For example, individuals are able to recover self-control resources through rest, relaxation, and supplementation (e.g., glucose) (Muraven et al. 1999; Gailliot and Baumeister 2007; Tyler and Burns 2008). Additionally, Tice et al. (2007) provide evidence that positive affect (e.g., positive mood, emotions) can help individuals reassert their volitional power. If, as hypothesized, multi-tasking drains auditors' self-control resources, thereby causing impaired judgment quality, designing theory-based mechanisms to mitigate this effect will provide implementable methods to maintain high audit quality. I examine one such intervention, exposure to positive affect, to consider if the replenishment of self-control resources can improve judgment quality on a subsequent audit task.

To examine these issues, I conduct an experiment in which audit seniors complete three audit tasks. I vary how audit evidence necessary to complete the first two tasks is presented across two conditions: divided (*multi-tasking*) and *sequential*. After completing the first two tasks, half of the participants receive a short memo intended to induce positive affect before moving on to a third audit task, a review of accounts receivable audit workpapers. Based on the dual-task paradigm used in prior depletion research (e.g., Baumeister et al. 1998), auditors' judgments (identification of seeded workpaper errors) on the third audit task serve as the dependent variable. Additionally, I develop a unique measure of self-control, independent of any

of the audit tasks, grounded in the theoretical definition of depletion and based on measures in prior psychology research.

I find that auditors are susceptible to the predicted negative effects of depletion in that auditors' judgment quality suffers after they experience depletion. Specifically, when auditors multi-task, they identify fewer seeded errors during a subsequent workpaper review task compared to auditors who sequentially complete the same tasks. I also find that a positive affect intervention mitigates this negative influence of multi-tasking. Further, the deleterious effect of multi-tasking, as well as the moderating influence of my intervention, is fully mediated by auditors' self-control, indicating that depletion is the causal mechanism driving my findings. This finding is a key contribution given that several unavoidable features of the audit environment—multi-tasking, engaging in cognitively complex tasks, and exhibiting professional skepticism—likely tax auditors' self-control resources (Majors et al. 2014).

Additional analyses show that depletion affects not only the *number* of errors identified, but also the *type* of errors identified. Specifically, auditors who have previously multi-tasked detect a lower proportion of seeded errors that are conceptual, and a higher proportion of seeded errors that are mechanical. That is, auditors, when depleted, appear less able or willing to identify the more difficult to comprehend conceptual errors. This finding is consistent with depletion research, which finds that individuals' ability to engage in complex reasoning, such as that required to identify conceptual errors, is impaired when in a depleted state (e.g., Schmeichel et al. 2003).

This study's theory and findings have implications for audit research and practice. It is the first to find that multi-tasking has a lingering negative effect on the quality of auditors' judgments. Given this finding, audit firms might consider ways to limit auditors' need to multi-

task. For example, audit firms may consider communicating with their clients to stress the need for timely and complete fulfillment of auditors' evidence request to facilitate sequential completion of audit tasks. However, multi-tasking likely cannot be eliminated, nor can firms eliminate the many other depleting tasks facing auditors. Thus, it is important to highlight mechanisms that firms can employ to mitigate the negative effects of multi-tasking and other tasks expected to deplete self-control. Further, this study answers the calls in prior auditing research (Nelson and Tan 2005) to examine how emotions can influence auditors' performance. The affect-based solution provides audit firms with a low cost management strategy to combat potential impaired judgment quality caused by self-control deficits. While I focus on an affect-based intervention, psychology research suggests that there are a number of other ways to replenish self-control (i.e., rest, relaxation, rewards).

My contribution is based on determining the theoretical antecedents of potential risks to the quality of audit judgments and then using an understanding of these causal factors to develop potential solutions to the problem. Beyond informing auditors and researchers regarding multi-tasking and positive affect, this study contributes more broadly to the audit literature that examines how self-control depletion can influence the quality of audit judgments. This study's findings suggest a need for further research into the role of self-control in auditing, including other causes of depletion, what tasks are especially dependent on auditors' self-control, and how auditors' self-control may be strengthened. This study also extends psychology literature by examining the effects of depletion in a professional audit environment where incentives, pressures, and tasks may differ significantly from those typically present in psychology studies.



The remainder of this paper is organized as follows. The next chapter provides background and hypothesis development. Chapters 3 and 4, respectively, present the research method and results. Chapter 5 presents conclusions, implications, limitations, and avenues for future research.

## CHAPTER 2

### BACKGROUND AND HYPOTHESIS DEVELOPMENT

#### **Multi-Tasking**

Multi-tasking—handling the demands of more than one task simultaneously—has increased in a variety of industries over the last several decades (Spink et al. 2008).<sup>3</sup> The increase of multi-tasking is generally attributable to improvements in the flow of information through communication networks enabled by information technology. Technologies such as electronic data files, mobile devices, and email support the rapid dissemination of information (Breshnan et al. 2002). Accordingly, individuals are faced with increasing amounts of divided information, frequent interruptions, and numerous inputs, resulting in multi-tasking behavior (Appelbaum et al. 2008).

Along with the increased incidence of multi-tasking, consideration of its effects also has increased. Research has demonstrated benefits of multi-tasking, such as greater productivity because of the ability to (1) meet the changing demands of the workplace (Freedman 2007), (2) ease multiple work requirements, and (3) leverage knowledge from one task to another (Lindbeck and Snower 2000). However, research on multi-tasking generally finds that it imposes cognitive costs on individuals. For example, Allport et al. (1994) propose that there are significant carryover effects from one task to another, resulting in interference in effectively

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<sup>3</sup> While I present the more classical definition of multi-tasking, professionals commonly equate the act of *switch*-tasking (i.e., going back and forth between multiple tasks, but not processing the tasks simultaneously) with multi-tasking. While there are marked differences between the two actions, consistent with prior audit research, I do not attempt to distinguish between the two in this study, and I use the term multi-tasking throughout the paper.

completing the two tasks. Rogers and Monsell (1995) find that there are significant reconfiguration costs (i.e., mentally switching between characteristics of one task and another) associated with multi-tasking.

### **Multi-Tasking in Auditing**

Multi-tasking behavior also has increased in auditing (Bhattacharjee et al. 2013). It is common, for example, for auditors to utilize multiple computer monitors while in the field, enabling them to easily switch back and forth between multiple tasks and/or multiple clients. Additionally, auditors are nearly always connected to their clients through email, shared drives, and client portals. This constant connectedness makes it possible for auditors to “wrap-up” audit tasks from prior engagements while at another client’s office. As Bhattacharjee et al. (2013, 1) state, “the pervasive reality for auditors is that they often are simultaneously working on multiple tasks and even multiple clients in the same work sessions.”

Prior literature shows that auditors are susceptible to information processing and memory-related errors while multi-tasking. For example, Lindberg and Maletta (2003) examine auditors’ assessments of internal control over inventory when completing the same assessment for two distinct companies. Results suggest that auditors are prone to commit conjunction-related memory errors during multi-tasking sessions. Similarly, Bhattacharjee et al. (2007) provide evidence of a cascading contrast effect, suggesting that auditors do not independently process information when performing similar evaluation tasks over multiple clients during one work session. Further, O’Donnell and Schultz (2005) find evidence of a halo effect, such that judgments made during strategic risk assessments bias account-level risk assessments by altering auditors’ determination of unusual fluctuations.

It is important to note that these studies demonstrate the difficulty of independently completing individual tasks and maintaining focus when switching tasks. Additionally, each of these studies focus on performance *during* multi-tasking, whereas I consider whether multi-tasking has a lingering negative effect on auditors' *subsequent* performance. A growing body of psychology research suggests that multi-tasking requires auditors to expend self-control resources, leaving them in a depleted state of self-control and susceptible to impaired judgment quality.

### **Ego Depletion Theory**

Ego depletion is a theory that describes individuals' limited ability to exercise self-control in a variety of contexts.<sup>4</sup> The term "ego" comes from Freud's (1923) seminal work on the structural model of the psyche and, it also is commonly referred to as executive control or cognitive focus. In essence, exertion of cognitive resources during a task that requires self-control depletes the resources available for other tasks, resulting in impaired future performance (Majors et al. 2014). For example, a dieter who has been resisting temptation all day becomes less able to resist temptation by the end of the day. Interestingly, these self-control resources are not task specific, but rather impact one's ability across tasks, or even types of task (e.g., physical tasks [Baumeister et al. 1998]; cognitive tasks [Schmeichel et al. 2003]; emotional tasks [Tice et al. 2007]).

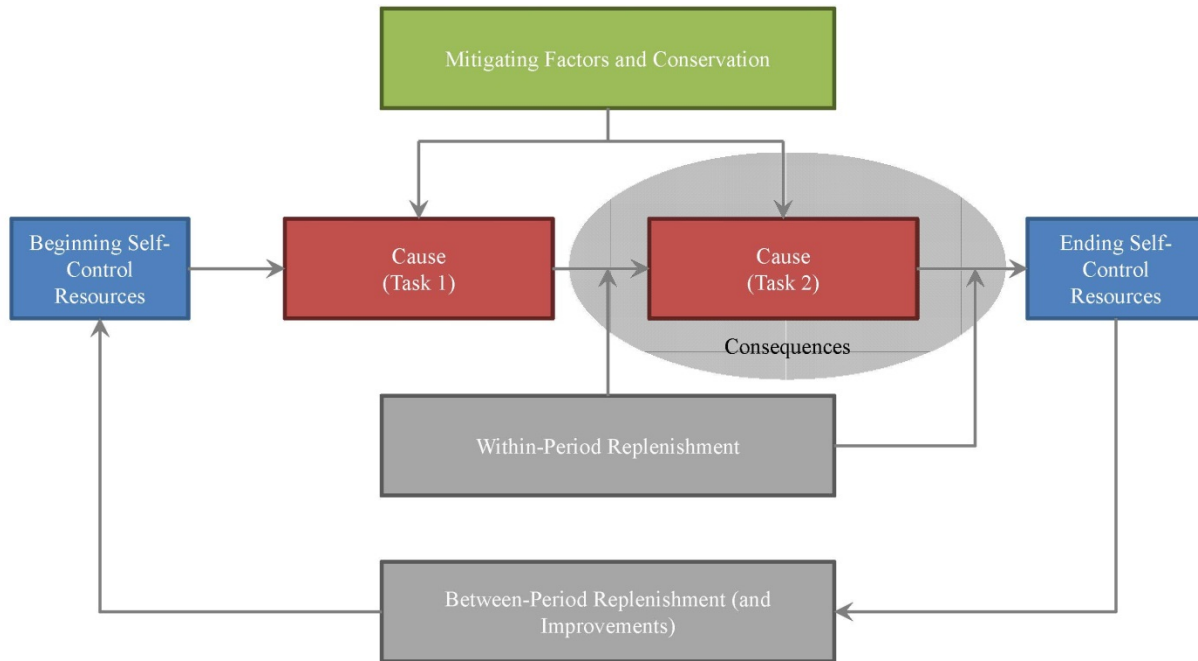
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<sup>4</sup> Hurley (2014) reviews the ego depletion literature in psychology and provides avenues for future research on depletion effects in auditing. Figure 1 provides the strength model of ego depletion, adapted from Hurley (2014).

**FIGURE 1**

**Strength Model of Ego Depletion**

*adapted from Hurley (2014)*



Depletion theory posits that individuals have a limited capacity to engage in what Kahneman (2011) calls Type II thinking. Specifically, tasks that require extensive cognitive resources require self-control to maintain this high level of cognition, thus reducing these resources. The depletion of these self-control resources diminishes one's ability to subsequently engage effectively in complex reasoning (Schmeichel et al. 2003). For example, as self-control resources are depleted, decision makers become less likely to critically analyze information and more likely to engage in heuristic processes (e.g., Masicampo and Baumeister 2008; Fischer et al. 2008). As Majors et al. (2014) note, auditors must use high levels of cognitive resources to maintain a questioning mind (i.e., exhibit professional skepticism), process contradictory

evidence, and critically assess evidence. Thus, auditors work in an environment in which self-control resources are frequently expended.

Since psychology researchers first postulated that self-control operates on a limited basis, many studies have examined causes of depletion. For example, Baumeister et al. (1998) found that resisting temptation can activate depletion. In their seminal study, when participants resisted the temptation to eat freshly baked chocolate chip cookies and instead were asked to eat radishes, their performance on a subsequent puzzle task suffered as compared to participants who were allowed to eat the cookies. Specifically, participants in the depletion condition exhibited increased passivity and a higher likelihood of accepting the status quo and quitting early.

Muraven et al. (1999) considered whether controlling one's emotion might cause self-control depletion. The authors designed an experiment where participants watched an emotionally evocative film. Before watching the film, participants were provided with one of three instructions: (1) to try to amplify their emotional response to the video, (2) to try to stifle their emotional response to the video, or (3) to watch the video without any specific instructions regarding their emotional response. After watching the video, participants were asked to hold a hand-grip strengthening device. Muraven and colleagues found that individuals' stamina on the hand grip suffered after they attempted to control their emotions (i.e., either amplify or trifle their emotions), a result they attribute to a decline in self-control resources. The authors explain that performance on the grip task appropriately proxies for self-control as stamina on this task involves resisting fatigue and overriding the urge to quit.

Muraven and Slessareva (2003) examined whether suppressing thoughts may be a cause of depletion. In their experiment, participants in the depletion condition were asked to list any thoughts that came to mind, with a specific instruction to avoid thinking of a white bear. If they

thought of a white bear, then they were instructed to write that down, but then immediately switch their thoughts. After completing the initial task (limited to five minutes), participants engaged in an unsolvable puzzle task. Participants' time spent on the unsolvable puzzle task proxies for self-control as persistence in the face of frustration requires self-control (e.g., Glass et al. 1969; Muraven et al. 1999). Results show, that when individuals suppress their thoughts, they quit working on the puzzle task significantly sooner than those in a control condition (i.e., depletion of self-control resources).

Schmeichel et al. (2003) focused on whether maintaining cognitive focus results in depletion. They found that, when individuals participated in a task that required them to regulate their attention, judgment quality (logic and reasoning, cognitive extrapolation, and thoughtful reading comprehension) suffered, compared to individuals who were not required to maintain focus. Findings from this study are especially insightful to auditing, as the results indicate that depletion effects are most pronounced for individuals who are using particularly high levels of cognitive resources, and auditors likely use high levels of cognitive resources to maintain a questioning mind, complete complex audit tasks, and critically examine audit evidence.

Freeman and Muraven (2010) tested whether task interruption causes depletion. Across three experiments, their participants began by engaging in either a card sorting (experiments 1 & 2) or word search (experiment 3) task. The researchers manipulated the presence and timing of an interruption (no interruption, interruption well in advance of completion, and interruption just before completion). Subsequently, participants engaged in a performance test that required attentional self-control. They found that, when participants were interrupted just before completing the initial task, their judgments suffered on the subsequent performance task. The authors attribute this effect to a deficit in self-control.

Burkley (2008) examined the interplay of depletion and persuasion. Across four experiments, the author considered whether resistance to persuasion causes depletion and whether self-control depletion leads to increased persuasion. In experiment 1, participants (college students) were presented with a persuasive memo stating that their university was considering shortening summer vacation to 1 month, and that the policy would occur in either 2 years or 10 years. The study relies on the idea that individuals are more resistant towards counterattitudinal statements which are more personally relevant (i.e., 2 year implementation plan, rather than 10 year). Results suggest that individuals who were more resistant to a persuasive message persisted for a shorter time on a subsequent unsolvable puzzle task, which proxies for self-control (e.g., Muraven and Slessereva 2003). Experiments 2, 3, and 4 manipulated the presence of a self-control depleting task (using a different self-control depletion task in each experiment), and then examined individuals' resistance to a persuasive memo. Across all three experiments, results indicate that individuals who had previously completed a self-control depleting task were more influenced by the persuasive memo. Thus, self-control resources are necessary to resist persuasion; self-control depletion likely leaves individuals susceptible to influence.

An important similarity among psychology studies that have examined ego depletion is that the posited causes of depletion all require the use of self-control. It follows that, if multi-tasking requires self-control, individuals' self-control resources will be depleted, and performance on subsequent tasks that require self-control will suffer. Applied to the context of this paper, if multi-tasking requires auditors to expend self-control (i.e., incremental to completing the same tasks sequentially), then their ability to maintain cognitive focus, and the



quality of their judgments in subsequent audit tasks (i.e., audit workpaper review), likely will be impaired.

### **Multi-Tasking and Self-Control**

Multi-tasking, relative to sequential completion, likely requires individuals to expend self-control resources for several reasons. First, switching tasks requires increased focus to independently process information between multiple tasks, and maintaining focus results in depletion (e.g., Muraven and Slessareva 2003; Schmeichel et al. 2003). Additionally, switching tasks requires goal shifting and rule activation, both of which require self-control resources (Rubinstein et al. 2001). For example, during an integrated audit, auditors commonly complete internal control and substantive testing. While the overall purpose of internal control and financial statement audits are similar (gathering evidence to evaluate the fairness of the client's reports), the specific testing goals and rules differ.

Finally, multi-tasking inhibits individuals from completing one task before moving on to other tasks. The dispositional need for closure is a characteristic that describes an individual's desire for definite knowledge on an issue (e.g., that comes from completing a task) and an aversion toward ambiguity (e.g., moving on to another task before completing another) (Webster and Kruglanski 1994).<sup>5</sup> Webster and Kruglanski find that accounting students score high on their dispositional need for closure scale, indicating that individuals who self-select into the accounting profession exhibit an especially high desire for closure and an aversion towards ambiguity. Bailey et al. (2011) find that audit staff and seniors tend to exhibit higher levels of

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<sup>5</sup> This disposition is enhanced by the perceived benefits of obtaining closure (i.e., facilitating audit workpaper review) and by the perceived costs of lacking closure (i.e., missing important audit reporting deadlines) (Webster and Kruglanski 1994).

dispositional need for closure relative to higher ranking auditors. Multi-tasking inhibits the ability to achieve closure, and prior depletion research provides strong support that suppressing desires, such as the dispositional need for closure, requires the use of self-control (e.g., Baumeister and Heatherton 1996; Metcalf and Mischel 1999).

Taken together, multi-tasking provides a strong operationalization of a task that depletes self-control resources. Applying findings from the depletion literature suggests that, after exerting the self-control required by multi-tasking, subsequent acts requiring self-control, such as making judgments and decisions during an audit workpaper review task, will be impaired.<sup>6</sup> This leads to the following hypothesis:

**Hypothesis 1:** Auditors required to multi-task will exhibit lower quality judgments during a subsequent audit task compared to auditors who sequentially complete the same tasks.

### **Positive Affect**

If, as hypothesized, multi-tasking depletes auditors' self-control resources, and thereby impairs judgment quality, then audit firms seemingly have two choices to combat this effect. First, they can attempt to plan and perform audits in a manner that reduces multi-tasking. For example, audit firms may train their staff on the importance of completing audit tasks in a sequential manner and avoiding interruptions to their work, such as checking their email or switching to another task. Audit firms also may choose to emphasize to their clients the need to provide complete responses to evidence requests in order to facilitate sequential processing. However, given that multi-tasking likely cannot be removed from auditing, an intervention to

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<sup>6</sup> In the context of a workpaper review task, lower judgment quality would involve identifying fewer preparer errors.

overcome the effects of multi-tasking is necessary. In this study, I consider whether exposing auditors to positive affect is effective at mitigating the self-control depleting effects of multi-tasking.

Positive affect is a broad psychology term that encompasses positive mood and emotions, which can be induced by affirming statements, expressing gratitude, and providing positive feedback (e.g., Fredrickson and Joiner 2002; Cialdini and Goldstein 2004). Accounting research uses the general term affect to cover moods and emotions. Emotions are reactions that are directed at something (e.g., a person, situation, or work task) and can be expressed in many ways (e.g., anger, sadness, happiness, joy). Moods can generally be separated into positive or negative affective states that are not directed at any specific trigger (Bhattacharjee and Moreno 2013). During an audit engagement, auditors commonly experience emotional reactions, such as liking or disliking toward client personnel, worry about components of audit tasks, or anxiety regarding time pressures (Bhattacharjee and Moreno 2013). Prior research reveals that an important consequence of auditors experiencing affect (both positive and negative) is that these reactions can impact auditors' decision making.

Generally, audit research on affect has focused on client likability, and negative feeling towards elements of an audit task. During an audit engagement, auditors must interact with their clients for the purpose of issuing an audit opinion. Such interactions include requests for audit evidence, inquiry regarding account balance fluctuations, and negotiations over audit adjustments. However, these interactions may result in differing effects on auditors' perception of client likability, and therefore affect. For example, auditors may encounter slow response timeliness when requesting audit evidence from client managers (Commerford et al. 2015), which likely elicits a negative affective reaction. Alternatively, during auditor-client

management negotiations, auditors may strategically use reciprocity to elicit client concessions (e.g., Sanchez et al. 2007), which likely results in a positive affective reaction. Thus, auditors are likely to have interpersonal emotional reactions (e.g., liking or disliking) towards client personnel. While feelings of liking or disliking toward the client should be irrelevant to an auditor's judgment, psychology research provides a robust literature suggesting that affective reactions exert a significant influence on judgments (e.g., Mittal and Ross 1998; Ashby et al. 1999; Finucane et al. 2000).

Following psychology research, audit researchers have designed studies to test whether affect influences auditors' judgments and decision making. For example, Bhattacharjee and Moreno (2002) examine the role of experience and an irrelevant negative affect cue related to the client (i.e., emotional information about the client that did not affect client reliability or audit risk) on auditors' judgments. They find that, when less experienced auditors were provided with negative affect information related to the client, their risk assessments were significantly higher than when no affect information was provided. Interestingly, they find no such differences for the more experienced auditors.

Bhattacharjee et al. (2012) follow up on these findings by considering whether affective reactions toward the client impact auditors' sensitivity to client competence to influence auditors' assessment of the persuasiveness of audit evidence. Guided by work on the Elaboration Likelihood Model (e.g., Chaiken and Maheswaran 1994; Finucane et al. 2000) the authors generally expect that auditors will rely on affective reactions to a greater extent for lower versus higher competence clients, and that when auditors' experience a negative (as opposed to neutral or positive) affective reaction towards the client they will be less persuaded by client provided evidence (i.e., provide more conservative judgments). They conduct an experiment in which they

provide participants a narrative intended to prompt either a negative, neutral, or positive emotional reaction towards the client, and information representative of either a higher or lower competence client. Consistent with their predictions, they find that affect toward the client and client competence interactively influence auditors' assessment of the persuasiveness of client provided audit evidence. Specifically, negative affect toward the client results in auditors' assessing client provided evidence as less persuasive, and this effect is heightened when client competence is lower, rather than higher.

Robertson (2010) examines the extent to which ingratiation—strategically inducing affect to facilitate persuasion—by the client impacts auditors' judgments. Findings suggest that, when the client ingratiates, auditors experience positive affective responses and are more likely to agree with a subsequent client request. Further, this effect is heightened when the client appears to have high incentives for meeting earnings targets. These findings are consistent with organizational behavior and social psychology literature which indicates that ingratiation tactics can influence the judgments of individuals through its effect on positive affect (e.g., Wayne and Ferris 1990; Orpen 1996; Cialdini and Goldstein 2004). This is particularly relevant to this current study as I consider whether a positive affect cue (i.e., provided by audit firms) can positively impact auditors' judgments.

Taken together, these studies indicate that affect can influence auditors' judgments and decision making. Interestingly, these studies focus solely on the negative impact that affective reactions can have on auditors' judgments. As Bhattacharjee and Moreno (2013, page 2) note in their review of auditing literature on affect, “all of these studies reveal that emotions and moods have the potential to inappropriately influence audit judgments.” However, psychology research suggests that affective responses can improve judgment quality. For example, research by

Fredrickson and colleagues (1998, 2001, 2002) finds that positive affect increases individuals' thought-action repertoires (i.e., fight or flight), encourages persistence on task, and broadens attention and cognition. The result is that individuals are better able to build their physical, intellectual, social, and psychological resources (Fredrickson and Joiner 2002). The current study builds on this line of psychology research by considering a situation where positive affect is intended to improve auditors' judgment quality. This study also builds on previous auditing literature which, to date, has only focused on the negative ramifications of affect.

Prior audit research also suggests that affect may be induced by another party (e.g., Robertson 2010). However, prior studies have focused on the client as a potential source of affect. This study differs in that it considers the audit firm as a potential source of positive affect. Additionally, research in psychology suggests that positive affect can replenish self-control, resulting improved decision making. Thus, this study provides evidence on the efficacy of positive affect as an intervention that audit firms' can use strategically to improve auditors' judgment quality through its indirect effect on self-control.

### **Positive Affect and Self-Control**

An important element of depletion theory is that self-control resources can be replenished (Hagger et al. 2010). As Tice et al. (2007, 379) state, "clearly, the self's resources do not remain depleted forever—otherwise the course of adult life would be a progressive (and most likely rapid) downward spiral in the capacity of self-control." Testing the efficacy of an intervention designed to replenish self-control provides an opportunity to counteract causes of depletion that likely in the auditing environment, resulting in more consistent and appropriate judgments. Prior studies have found that short periods of rest and relaxation (Tyler and Burns 2008), and rewards

(Hagger and Chatzisarantis 2013) can have a replenishing effect on one's self-control resources. Additionally, Tice et al. (2007) provide evidence that brief inductions of positive mood or emotion help the self to reassert its volitional power. They find that, after an initial act of self-control, participants performed as well on subsequent tasks requiring self-control after receiving inductions of positive mood or emotion as those participants who were not depleted, and better than participants who were depleted but did not receive the positive mood induction.

Several psychology studies support Tice's findings that positive affect may facilitate self-control, even in a depleted state. For example, positive emotion encourages creativity by empowering the self to override uncreative moods of thought, and allowing new solutions and alternatives to problems (Isen 1984, 1987). Positive affect also has been linked to an improvement in motivation, which often is decreased after being subjected to a depleting mechanism (e.g., Deci et al. 1999).<sup>7</sup> Consequently, I predict that strategically inducing positive affect will mitigate the depleting effects of multi-tasking, thereby leading to improved auditor judgment quality. This leads to the following interaction hypothesis:

**Hypothesis 2:** The negative effect of multi-tasking on auditors' judgment quality during a subsequent audit task will be mitigated by an intervention of positive affect.

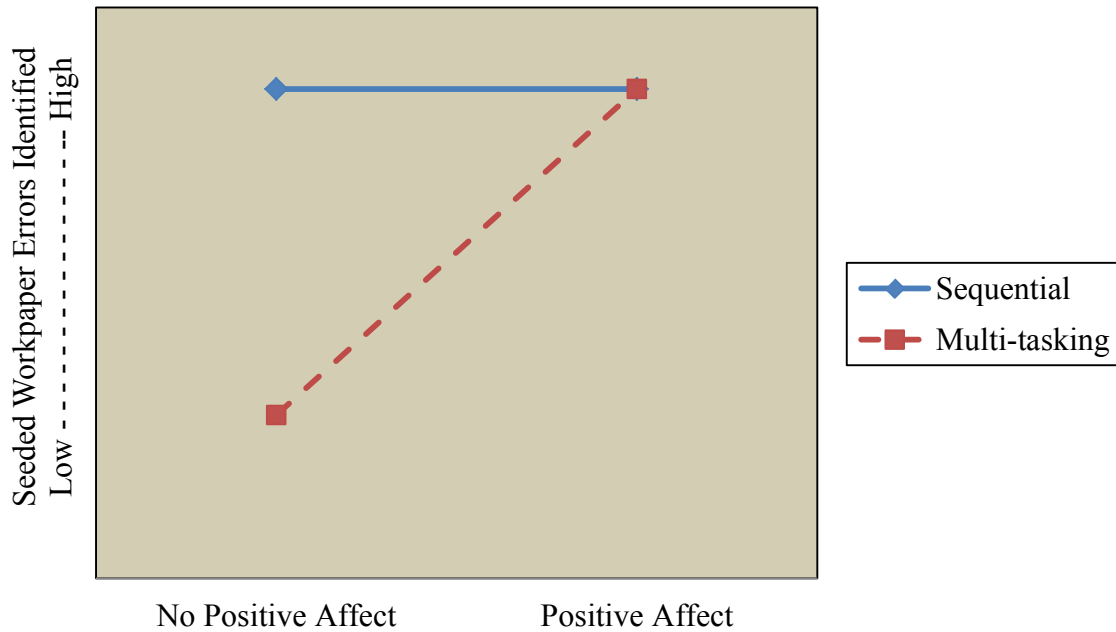
Figure 2 provides the main effect predicted in Hypothesis 1 and the interaction effect predicted in Hypothesis 2.

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<sup>7</sup> Interestingly, research on depletion has not drawn a clear link between motivation and depletion. Hagger et al. (2010) note the following competing explanations: (1) depletion and motivation are separate constructs, but motivation may have a moderating effect on depletion, and (2) depletion effects are a function of reduced motivation to perform subsequent tasks. Accordingly, I measure and test for the effects of motivation.

FIGURE 2

Hypothesized Effects (H1 and H2)



**Mediating Effect of Self-Control**

The theoretical development above suggests that self-control is the causal mechanism underpinning the predicted effects of multi-tasking and positive affect on auditors' judgment quality. Specifically, multi-tasking requires auditors to use self-control in order to overcome their dispositional need for closure and to maintain cognitive focus in order to engage in goal shifting and rule activation. Further, research suggests that these self-control resources can be replenished via positive affect. Thus, multi-tasking and positive affect influence auditors' judgment quality through their effect on auditors' self-control resources (see Figure 3), yielding the following moderated mediation hypothesis:

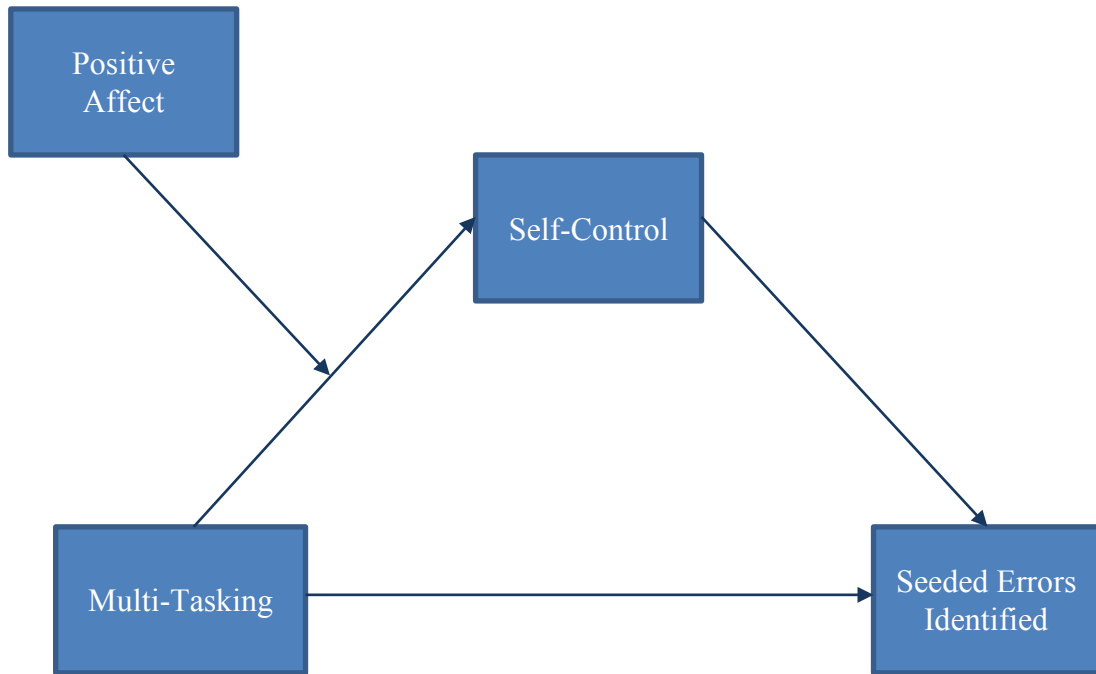


**Hypothesis 3:** The main effect of multi-tasking (Hypothesis 1) and the moderating effect of positive affect (Hypothesis 2) are mediated by self-control.

---

**FIGURE 3**

**Hypothesized Conceptual Model of Moderated Mediation**



## CHAPTER 3

### METHOD

#### **Participants**

Eighty-three audit seniors from multiple Big 4 firms completed the experiment. I obtained the majority of participants at national training sessions, while others completed the experiment in their offices. The results reported below do not differ based on data collection site. The experimental materials asked participants to provide key demographic information. Demographic information, both in summary and by experimental condition, are provided in Table 1. Audit experience ranged from 2.5 to 7.8 years, with mean experience of 4.1 years.<sup>8</sup> Thus, the participants were commensurate with the commonly used title of audit senior. Prior research as well as discussions with audit partners confirms that auditors with this level of experience should be familiar with all of the experimental tasks, including the workpaper review task used to capture the dependent variables (e.g., Owhoso et al. 2002). Additionally, gender was split nearly evenly between female (49.4 percent or 39 total) and male (50.6 percent or 40 total). To ensure randomization was effective, I examined whether any of the demographic information varied by condition. I found no significant differences in any of the demographic information between experimental conditions, suggesting that randomization was effective (results not tabulated).

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<sup>8</sup> There are no significant differences in mean months of experience between the four experimental cells.

**TABLE 1****Demographic Information**

	Experimental Conditions				Overall
	Sequential, No Positive Affect	Sequential, Positive Affect	Multitasking, No Positive Affect	Multitasking, Positive Affect	
Experience (1-9 scale) with Task 1, a search for unrecorded liabilities	7.5	7.9	7.9	8.1	7.8
Experience (1-9 scale) with Task 2, internal control testing	7.4	7.7	7.8	7.9	7.7
Experience (1-9 scale) with Task 3, workpaper review	7.7	7.3	7.2	7.8	7.5
Auditing experience (in months)	46.6	47.9	48.2	50.5	48.9
Percentage of year spent auditing public companies	50.7	51.3	43.7	46.7	48.9

This table provides demographic information for all participants included in analyses.

## **Experimental Tasks**

Figure 4 summarizes the experimental design. The experimental materials include background information about two hypothetical audit clients, Wareham Electronics, Inc. (WEI), and LD Corp. (LDC), the participant's role in the case (audit senior), and task instructions. Participants were tasked with completing a search for unrecorded liabilities (SURL) for WEI, internal control (IC) testing for LDC, and a workpaper review of accounts receivable testwork for WEI. For clarity, I refer to the first two tasks as preparer tasks, and the final task as a reviewer task. After these tasks, participants respond to manipulation check questions and questions intended as control variables (see Figure 5), and provide demographic information (see Figure 6). Finally, participants complete a measure of self-control.

### ***Multi-Tasking Manipulation***

Consistent with depletion research in psychology (e.g., Baumeister et al. 1998; Vohs et al. 2008), my experiment employed a dual-task paradigm. I manipulate the manner in which the preparer tasks are completed at two levels: multi-tasking and sequential. The first preparer task requires participants to complete a SURL by testing ten disbursements that occurred subsequent to WEI's fiscal year-end. Participants assigned to the multi-tasking conditions receive the first eight invoices before being told that the remaining evidence (i.e., two invoices) will be provided at a later time and that they should begin internal control testwork immediately. I then provide them with the instructions and audit workpaper necessary to begin the second preparer task.

The second preparer task involves testing whether LDC's IC requiring dual signatures on checks written over \$10,000 is functioning effectively, by examining copies of checks from a pre-selected sample of disbursements. Participants in the multi-tasking conditions receive the

FIGURE 4

Experimental Design

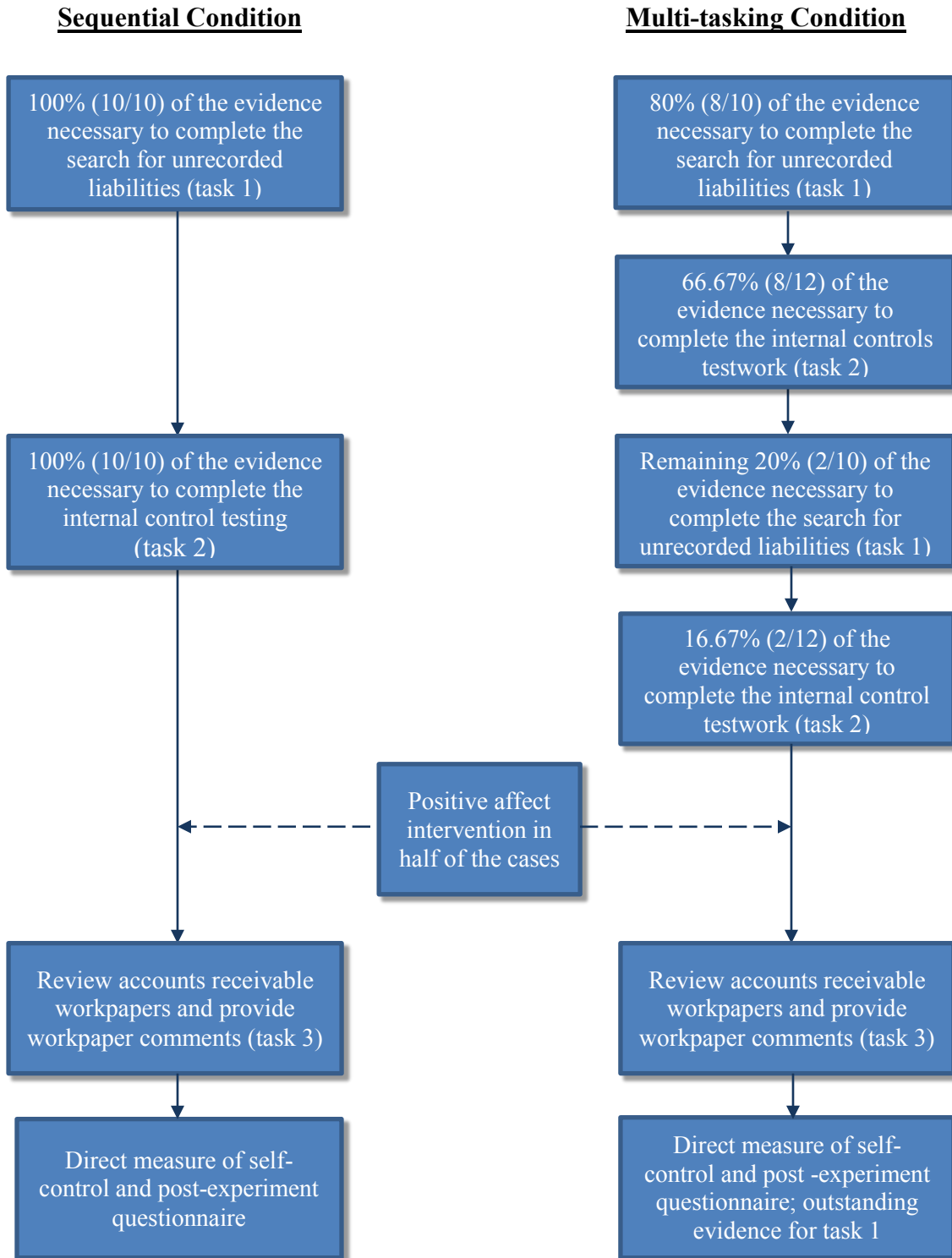


FIGURE 5

Manipulation Check Questions and Control Variables

**INSTRUCTIONS:** Please respond to the short list of questions below (Again, all of your responses are confidential):

- 1) Please recall the first two audit tasks you engaged in during this study (i.e., a search for unrecorded liabilities and internal controls testing). Please circle the response below that reflects your experience in completing these two tasks.
  - a) I was **able** to complete the search for unrecorded liabilities task before beginning the internal control testing task.
  - b) I was **unable** to complete the search for unrecorded liabilities task before beginning the internal control testing task (i.e., I had to go back and forth between the two tasks).
- 2) Were you able to complete the internal controls testing?
  - a) **Yes**, I completed the internal controls testing.
  - b) **No**, I did not complete the internal controls testing. It is still an “open item”.
- 3) To what extent did you think about the potential internal control failure (i.e., task 2) while you completed the workpaper review task (i.e., task 3)?

Not at all (1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	Very much (9)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- 4) When you got to the third audit task (workpaper review), how motivated were you to accomplish this task? Indicate your motivation by placing an X in the appropriate box:

Not motivated at all (1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	Very motivated (9)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5) Please indicate your experience (i.e., familiarity) with the three audit tasks you completed in this study by placing an X in the appropriate box:

	Not experienced at all							Very experienced	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Search for unrecorded liabilities									
Internal control testwork									
Workpaper review									

**FIGURE 6**

**Demographic Questions**

**INSTRUCTIONS:** Please respond to the short list of questions below (Again, all of your responses are confidential):

6) How many total **MONTHS** of audit experience do you have? \_\_\_\_\_ **MONTHS**

7) In a given year, what percentage of your time is typically spent auditing public clients?  
\_\_\_\_\_ %

8) Gender (please circle):

- Male
- Female

first eight (of 12) check copies before being told that the remaining evidence (four checks) will be provided at a later time, and asked to switch back to the SURL. Auditors in the multi-tasking conditions next receive the remaining two invoices necessary to complete the SURL, followed by two additional check copies related to the IC testwork.<sup>9</sup> Thus, participants in the multi-tasking conditions are required to multi-task between the first two preparer tasks.

I provide participants assigned to the sequential completion condition with all of the invoices necessary to complete the SURL, followed by all of the check copies necessary to complete the IC testwork.<sup>10</sup> Consequently, participants in the sequential conditions are able to complete the SURL before completing the IC testwork.

It is important to note that the second audit task (IC testwork), which participants in the multi-tasking conditions did not complete, relates to a different audit client (LDC) than the subsequent workpaper review task (WEI) in which I measured the dependent variables. I made this design choice due to prior research that suggests reaching a conclusion on one audit task may affect how auditors evaluate evidence in subsequent audit tasks for the same audit client (i.e., halo effect) (O'Donnell and Schultz 2005). Thus, the second preparer task, in which participants in the sequential conditions receive closure and those in the multi-tasking conditions do not, is for an audit client unrelated to the subsequent workpaper review task. Additionally, participants are explicitly instructed that any conclusions reached or evidence tested during the second preparer task should not be considered when completing the workpaper review task, as it pertains to a different audit client.

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<sup>9</sup> For participants in the multi-tasking conditions, the remaining two check copies necessary to complete the IC testing are provided to participants after they complete the self-control measure.

<sup>10</sup> In order to detect any differences in effort between conditions, I ask participants to self-report the amount of time spent completing the first two audit tasks (see additional analyses).



### ***Positive Affect Manipulation***

After completing the first two tasks, all auditors received a memo that included instructions for the review task. For auditors in the positive affect condition, the memo also included a short statement intended to induce positive affect. The memo expressed the firm's and author's gratitude for participation, described the firm's perceived importance of this study, and stated that the firm identified the participant as an audit expert who is uniquely qualified to provide insight for this study. Figure 7 presents the additional memo content provided to participants in the positive affect conditions. Prior psychology research suggests that such statements represent key elements of the positive affect construct (Tice et al. 2007). Participants then completed the review task, which is used to capture the dependent variables.

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#### **FIGURE 7**

##### **Positive Affect Manipulation**

**Thank you** once again for your participation in this study. As a former auditor myself (I spent five years in public accounting), I understand how critical audit seniors are to every audit engagement. **You are the front-line control over the cost and quality of auditing.** My aim with this study is to better understand how you complete audit procedures, with an ultimate aim of **improving the audit industry. Your performance in this study will help meet this goal.** Additionally, during my conversations with your audit firm, they have identified your group of seniors as **audit experts** who are qualified to complete this study.

---

### ***Workpaper Review Task and Dependent Variables***

The workpaper review task included a partial audit program, a lead sheet, and six workpapers that focus on the audit of WEI's accounts receivable and related financial statement accounts (i.e., allowance for doubtful accounts, bad debt expense). Participants were told that the workpapers were completed by a staff auditor on the audit team for WEI and that they were responsible for reviewing the files and providing any review comments they deemed necessary. Following Owhoso et al.'s (2002) design, there were a total of 10 errors seeded in the audit staff workpapers, which are detailed in Figure 8. Participants were provided with a worksheet in which they could provide their workpaper review comments. The dependent variables relate to auditors' judgments and decisions during the workpaper review task. The key dependent variables include (1) the number of seeded errors identified, and (2) the total number of workpaper review comments provided for the preparer. Capturing review notes as the dependent variable provides a realistic measure of participants' performance (Rich et al. 1997). I also record the type of error identified, conceptual versus mechanical, as depletion literature suggests that the more cognitively demanding conceptual errors will be most affected by depletion.

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**FIGURE 8****Listing of Errors Seeded in the Workpaper Review Task**

<b>W/P Ref.</b>	<b>Error Description</b>	<b>Type of Error</b>	
1)	C.01	Staff auditor did not investigate significant increase in the average age of receivables.	Conceptual
2)	C.02	Trade accounts receivable includes receivables from employees.	Mechanical
3)	C.03	Staff auditor incorrectly identified a customer order shipped on 12/30/13, FOB destination, and received on 1/2/14 as properly included in the 2013 Accounts Receivable balance.	Mechanical
4)	C.03	Differences noted on sampled confirmations were not projected to the population.	Conceptual
5)	C.04	Accounts receivable bucket balances used in current year allowance calculation are prior year balances.	Mechanical
6)	C.04	Allowance for doubtful account has not been adjusted for current year recoveries.	Mechanical
7)	C.04	Allowance for doubtful accounts balance in the workpaper reflects prior year balance rather than current year.	Mechanical
8)	C.04	Accounts receivable greater than 365 days are not included in the hindsight analysis.	Mechanical
9)	C.04	Hindsight analysis indicates the client historically underestimates the allowance.	Conceptual
10)	C.04a	Abnormal write-off of accounts near year-end was not investigated.	Conceptual

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This figure provides a listing of the errors seeded in the workpaper review task.

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### ***Direct Measure of Self-Control Depletion***

Prior psychology studies have designed many different tasks intended to measure individuals' self-control. However, these measures were not logistically feasible in the current study. For example, many of these measures focus on participants' persistence in the face of physical discomfort (e.g., drinking an undesirable liquid, holding their hand in icy water (Vohs et al. 2008)) or require excessive amounts of time to measure (Baumeister et al. 1998). I therefore designed a task to capture the major facets of prior self-control measures, without the related physical or time-intensive characteristics. I asked participants to complete two "spot-the-difference" puzzles (see Appendix A). The participants' objective was to identify a number of differences between two otherwise similar images.<sup>11</sup> Completion of this puzzle task requires two fundamental facets of self-control—cognitive focus and persistence on an undesirable task (when quitting is a preferred and viable option).<sup>12</sup> Participants' level of self-control is calculated as the total number of differences identified.

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<sup>11</sup> The puzzles shared the characteristic that most participants would not be able to completely solve them, but would be able to identify at least some differences. This feature minimizes ceiling and floor effects.

<sup>12</sup> Task persistence is a common measure employed in psychology studies focusing on depletion (e.g., Baumeister et al. 1998; Schmeichel et al. 2003; Fischer et al. 2008; Freeman and Muraven 2010). For example, for the majority of participants, this was the last task to be completed during a full day of training. Participants were not given the total differences that could be found, allowing participants to determine when they were "finished" with the task.

## CHAPTER 4

### RESULTS

#### **Manipulation Checks**

To determine if participants adequately understood both aspects of the multi-tasking manipulation, I asked participants to (1) indicate whether or not they were able to complete the first preparer task (a search for unrecorded liabilities) before beginning the second preparer task (internal control testing); and (2) whether or not they completed internal control testing. Four of the 83 participants (4.8 percent) incorrectly answered one or both of the manipulation check questions. Three participants failed the first manipulation check question only, while one failed both questions. I removed participants who failed one or both of the manipulation checks from the main analysis, resulting in 79 usable responses. If these participants' responses are included, patterns of cell means and statistical inferences are the same as those reported.

To determine if I manipulated positive affect successfully, participants completed a shortened version of the Brief Mood Introspection Scale (BMI; Mayer and Gaschke 1988), which required participants to indicate how well each of seven adjectives described their mood during the experiment. The adjectives included "Happy," "Sad," "Caring," "Content," "Grouchy," "Calm," and "Irritated," with responses provided on four point scales with (1) "Definitely do not feel," (2) "Do not feel," (3) "Slightly feel," and (4) "Definitely feel" as choices. Consistent with Mayer and Gaschke (1988), in order to compute a single mood rating, I added participants' numerical responses. I reverse-coded responses to negative mood adjectives "Sad", "Grouchy", and "Irritated" to be consistent with the other mood questions. The mean

mood rating is higher in the *Positive Affect* conditions than in the *No Positive Affect* conditions (22.70 versus 18.54,  $F = 23.30$ ,  $p < 0.01$ , Table 2; Panels A and B), which supports a successful manipulation of positive affect. I evaluate the reliability of the mood measure by examining Cronbach's alpha ( $\alpha=0.88$ ). In general, 0.7 is considered acceptable (Field 2013), suggesting that I appropriately measured the mood construct. See Figure 9 for the shortened version of the Brief Mood Introspection Scale used in this study.

**TABLE 2**

**Modified Brief Mood Introspection Scale Scores**

**Panel A: Mean (Std. Dev.)**

	No Positive Affect	Positive Affect	Collapsed Across Positive Affect
Sequential	20.55 (4.22) n=20	23.85 (2.46) n=20	22.20 (3.80) n=40
Multi-tasking	16.42 (4.69) n=19	21.55 (3.09) n=20	19.05 (4.68) n=39
Collapsed Across Multi-Tasking	18.54 (4.87) n=39	22.70 (2.99) n=40	

**Panel B: ANOVA Results**

	F	p-value
Multi-tasking	13.98	<0.001
Positive Affect	23.30	<0.001
Multi-tasking*Positive Affect	0.92	0.277

This table provides descriptive statistics and ANOVA results of the modified brief mood introspection scale scores for all participants. All p-values are two-tailed.

**FIGURE 9**

**Shortened Brief Mood Introspection Scale**

**INSTRUCTIONS:** Circle the response on the scale below that indicates how well each adjective or phrase describes your present mood:

	Definitely do not feel 1	Do not feel 2	Slightly feel 3	Definitely feel 4
Happy	1	2	3	4
Sad	1	2	3	4
Caring	1	2	3	4
Content	1	2	3	4
Grouchy	1	2	3	4
Calm	1	2	3	4
Irritated	1	2	3	4

Overall my mood is:

Very Unpleasant																			Very Pleasant	
-10	-9	-8	-7	-6	-5	-4	-3	-2	-1	0	1	2	3	4	5	6	7	8	9	10

**Multi-Tasking (H1)**

Hypothesis 1 predicts that auditors who multi-task during two preparer tasks will identify fewer seeded errors during a subsequent review task compared to auditors who sequentially complete the same two preparer tasks. Results, reported in Table 3, indicate that, when auditors multi-task, they identify fewer seeded errors during the review task (3.59) than auditors who work sequentially (4.73, p-value < 0.01; Table 3, Panels A and B). Recall that a total of 10 preparer errors were seeded in the workpapers subject to review. The mean number of seeded errors identified for all participants was 4.17, resulting in an error detection rate of 41.7%. This rate is consistent with prior research that uses review notes to determine detected errors (i.e., Owhoso et al. 2002).

**TABLE 3****Seeded Errors Identified****Panel A: Mean (Std. Dev.)**

	No Positive Affect	Positive Affect	Collapsed Across Positive Affect
Sequential	4.45 (1.64) n=20	5.00 (1.08) n=20	4.73 (1.40) n=40
Multi-tasking	2.58 (1.74) n=19	4.55 (1.64) n=20	3.59 (1.94) n=39
Collapsed Across Multi-Tasking	3.54 (1.92) n=39	4.78 (1.39) n=40	

**Panel B: ANOVA Results**

	F	p-value
Multi-tasking	11.17	<0.001
Positive Affect	13.18	<0.001
Multi-tasking*Positive Affect	4.19	0.022

**Panel C: Simple Effect of Positive Affect**

	No Positive Affect Mean (Std. Dev.)	Positive Affect Mean (Std. Dev.)	F (p-value)
Positive Affect Across Multi-Tasking	2.58 (1.74)	4.55 (1.64)	13.27 0.001

The dependent variable is defined as the number of seeded errors identified (out of a total of 10 possible errors) during a workpaper review task. All p-values are one-tailed due to directional hypotheses.



Additionally, auditors who multi-task provided fewer total workpapers comments (8.23) compared to auditors who work sequentially (9.80,  $p$ -value  $< 0.01$ ; Table 4, Panels A and B). To jointly test these two dependent variables, I conduct a two-way multivariate analysis of variance (MANOVA). Results, in Table 5, report a significant multivariate main effect of multi-tasking ( $F = 5.64$ ). These findings are consistent with the expectation that auditors who multi-task will exhibit lower judgment quality during a subsequent task as compared to those who sequentially complete tasks, therefore supporting Hypothesis 1. However, interpretation of this main effect should be considered in light of the interaction results discussed in the next section.

### **Positive Affect (H2)**

Hypothesis 2 predicts that positive affect will moderate the effect of multi-tasking, such that the negative effect of multi-tasking on subsequent judgment quality will be mitigated when auditors are provided with an intervention to induce positive affect. Consistent with this expectation, ANOVA results indicate a significant interaction for the number of seeded errors identified ( $p$ -value = 0.02; Table 3, Panel B). Figure 10 depicts the means for the dependent variable by condition and demonstrates that positive affect has the intended moderating effect on multi-tasking, providing support for H2. Specifically, multi-tasking has a lingering negative influence on auditors' propensity to identify workpaper errors, but the positive affect intervention mitigates this influence. The simple effect of positive affect when auditors multi-task is consistent with Hypothesis 2; participants identified significantly more seeded errors during the review task when exposed to the positive affect intervention (4.55) than without the intervention (2.58;  $p$ -value  $< 0.01$ ; Table 3, Panel C). Put another way, auditors appear to be

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**TABLE 4****Total Workpaper Comments****Panel A: Mean (Std. Dev.)**

	No Positive Affect	Positive Affect	Collapsed Across Positive Affect
Sequential	9.80 (3.79) n=20	9.80 (2.75) n=20	9.80 (3.27) n=40
Multi-tasking	6.42 (2.76) n=19	9.95 (3.39) n=20	8.23 (3.54) n=39
Collapsed Across Multi- Tasking	8.15 (3.70) n=39	9.88 (3.05) n=40	

**Panel B: ANOVA Results**

	F	p-value
Multi-tasking	5.00	0.014
Positive Affect	5.97	0.009
Multi-tasking*Positive Affect	5.97	0.009

**Panel C: Simple Effect of Positive Affect**

	No Positive Affect Mean (Std. Dev.)	Positive Affect Mean (Std. Dev.)	F (p-value)
Positive Affect Across Multi-Tasking	6.42 (2.76)	9.95 (3.39)	12.63 0.001

---

The dependent variable is defined as the total number of workpaper review comments provided during a workpaper review task. All p-values are one-tailed due to directional hypotheses.

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**TABLE 5****MANOVA Results**

	F	p-value
Multi-tasking	5.64	0.005
Positive Affect	6.67	0.002
Multi-tasking*Positive Affect	3.31	0.042

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This table provides MANOVA results of the number of seeded errors and total number of workpaper comments provided by participants. All p-values are one-tailed due to directional hypotheses.

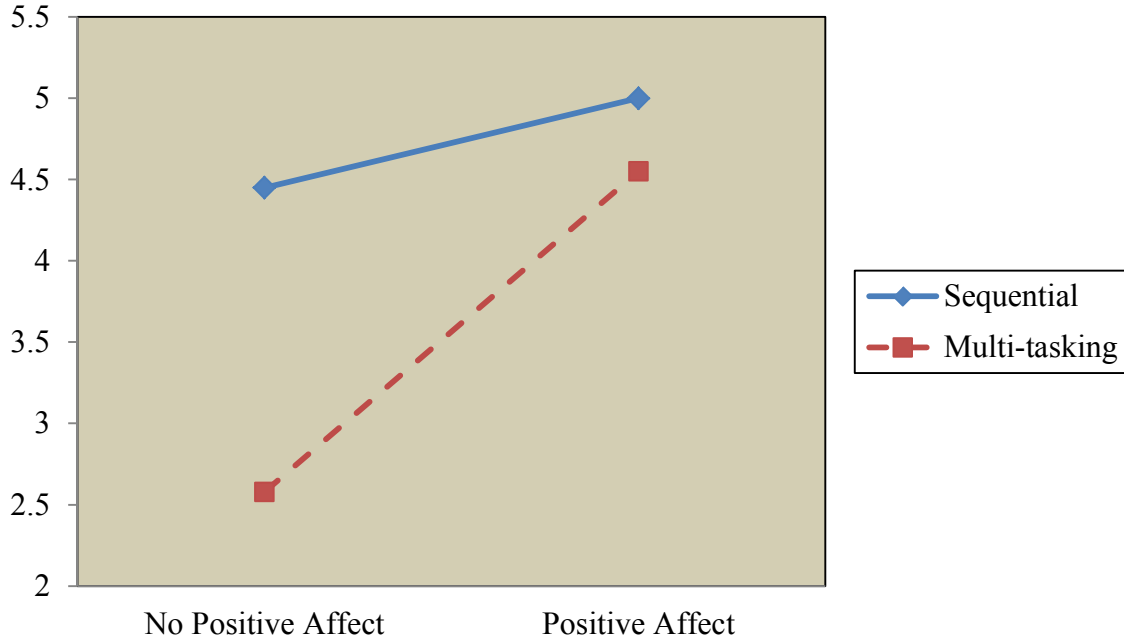
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able to overcome the cognitive cost associated with multi-tasking when they are exposed to positive affect. Given the expected order of the means implied by the first two hypotheses, I also test the contrast +1, +1, -3, +1 (where -3 is assigned to the multi-tasking/no positive affect experimental cell). This contrast test was significant ( $F = 26.62$ ;  $p\text{-value} < 0.01$ ; non-tabulated). MANOVA results also support H2 ( $p\text{-value} = 0.04$ ; Table 5). These results highlight the importance of audit firms, and specifically higher ranking members of an audit team (i.e., partner or in-charge), being aware of situations that deplete auditors' self-control resources (i.e., multi-tasking) so that they can intervene when necessary to mitigate the negative impact of depletion on judgment quality.

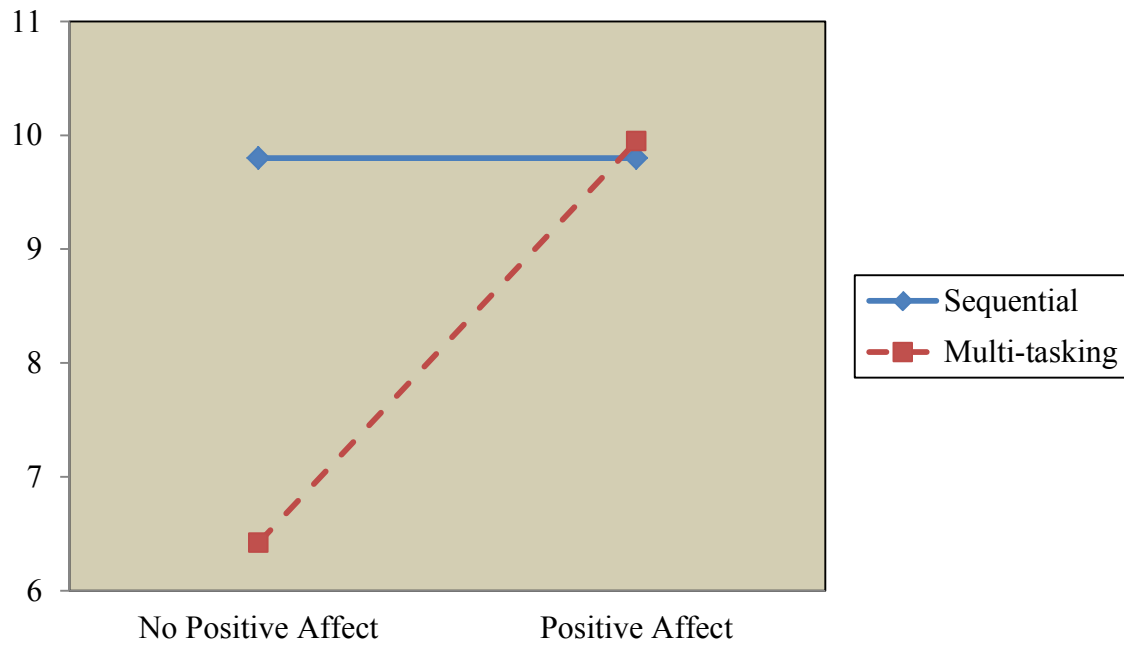
FIGURE 10

Univariate Results

Panel A: Seeded Errors Identified



Total Workpaper Comments Provided



### **Mediating Role of Self-Control (H3)**

I directly measured participants' self-control as the total number of differences identified between two spot-the-difference puzzles that were provided at the end of the experiment. On average, participants who had previously multi-tasked performed worse on the spot the difference puzzles as compared to participants who had sequentially completed the previous tasks (29.46 versus 35.18 differences identified, respectively;  $p$ -value  $< 0.01$ ; Table 6, Panels A and B). Examination of the simple effect of positive affect across the multi-tasking cells provides support for the notion that positive affect can replenish auditors' self-control (34.15 versus 24.53 differences identified;  $p$ -value  $< 0.01$ ; Table 6, Panel C).

Hypothesis 3 predicts that auditors' self-control will mediate the effect of multi-tasking on their ability to identify seeded errors during a workpaper review task and that positive affect will moderate this mediation effect. Specifically, when no positive affect intervention is introduced I expect that multi-tasking will deplete auditors' self-control resources, in turn yielding reduced judgment quality. Therefore, I predict that self-control will mediate the effect of multi-tasking on auditors' propensity to identify seeded errors. However, I expect that the negative effect of multi-tasking on auditors' self-control will be offset by a positive affect intervention, resulting in no mediating effect of self-control. In other words, there will be different mediation effects when positive affect is absent versus present.

Figure 3 illustrates the conceptual model of moderated mediation. Consistent with Hayes (2013), I use a bias-corrected bootstrap analysis to test for moderated mediation. This analysis involves 10,000 bootstrap resamples and 95% bias-corrected confidence intervals. Testing for moderated mediation involves estimating a mediation model at each level of the moderating variable (i.e., positive affect absent/present) and then testing the difference between the

---

**TABLE 6****Self-Control Measure Results****Panel A: Mean (Std. Dev.) Differences Identified on Two Spot-the-Difference Puzzles**

	No Positive Affect	Positive Affect	Collapsed Across Positive Affect
Sequential	34.30 (10.26) n=20	36.05 (6.41) n=20	35.18 (8.49) n=40
Multi-tasking	24.53 (9.23) n=19	34.15 (8.36) n=20	29.46 (9.95) n=39
Collapsed Across Multi- Tasking	29.54 (10.84) n=39	35.10 (7.42) n=40	

**Panel B: ANOVA Results**

	F	p-value
Multi-tasking	8.94	0.002
Positive Affect	8.49	0.003
Multi-tasking*Positive Affect	4.07	0.024

**Panel C: Simple Effect of Positive Affect**

	No Positive Affect Mean (Std. Dev.)	Positive Affect Mean (Std. Dev.)	F (p-value)
Positive Affect Across Multi-Tasking	24.53 (9.23)	34.15 (8.36)	11.67 0.001

---

The dependent variable is defined as the number of differences identified during a self-control measurement task. All p-values are one-tailed due to directional hypotheses.

---

indirect effects at each level. Table 7 provides a summary of mediation testing results. I find that, when the intervention of positive affect is absent, the confidence interval for the indirect effect of self-control is negative and excludes zero (95% confidence interval: -2.294, -0.529; Table 7, Panel B), supporting the notion that multi-tasking leads to depleted self-control, which in turn results in decreased judgment quality. Alternatively, when the intervention of positive affect is present, the confidence interval for the indirect effect of self-control includes zero indicating mediation is not occurring (95% confidence interval: -0.912, 0.372; Table 7, Panel B). That is, the mediating effect is eliminated when positive affect is present, because it replenishes participants' self-control. Finally, I find that the confidence interval of the index of moderated mediation (i.e., difference in indirect effects at the two levels of positive affect) is significant (95% confidence interval: 0.046, 2.237; Table 7, Panel C), supporting Hypothesis 3. In other words, self-control mediates the effect of multi-tasking on auditors' judgment quality in the absence, but not presence, of positive affect.

### **Additional Analyses**

#### ***Error Types Identified***

During an audit workpaper review task, a reviewer may come across mechanical or conceptual errors. While mechanical errors typically focus on the application of standard audit procedures (i.e., properly scanning a listing of accounts receivables for any related parties), conceptual errors demand more complex reasoning. For example, identifying an unusual fluctuation in the allowance for doubtful accounts requires an understanding of the inter-relationships between multiple financial statement accounts (e.g., accounts receivable, bad debt expense, allowance for doubtful accounts), a historical understanding of accounts receivable

**TABLE 7**  
**Mediation Analysis**

**Panel A: Model Results**

	<u>Coefficient</u>	<u>Std. Error</u>	<u>t-stat</u>	<u>p-value</u>	<u>Lower Limit Confidence Interval</u>	<u>Upper Limit Confidence Interval</u>
<b>Dependent Variable: Self-control</b>						
Multi-tasking	-9.774	2.778	-3.518	<0.001	-15.308	-4.239
Positive Affect	1.750	2.742	0.638	0.525	-3.713	7.213
Multi-tasking*Positive Affect	7.874	3.904	2.017	0.047	0.970	15.650
<b>Dependent Variable: Seeded Errors</b>						
Self-control	0.141	0.013	10.481	<0.001	0.114	0.167
Multi-tasking	-0.333	0.256	-1.300	0.198	-0.843	0.177

**Panel B: Conditional Indirect Effects of Multi-tasking on Seeded Errors Identified at Values of Positive Affect**

	<u>Effect</u>	<u>Std. Error</u>	<u>Lower Limit Confidence Interval</u>	<u>Upper Limit Confidence Interval</u>
Positive affect absent	-1.373	0.452	-2.294	-0.529
Positive affect present	-0.267	0.327	-0.912	0.372

**Panel C: Index of Moderated Mediation<sup>a</sup>**

	<u>Index</u>	<u>Std. Error</u>	<u>Lower Limit Confidence Interval</u>	<u>Upper Limit Confidence Interval</u>
Mediator: Self-control	1.106	0.563	0.046	2.237

Table 7 provides mediation analysis following the approaches outlined by Hayes (2013).

<sup>a</sup> Because positive affect (i.e., the moderator) is dichotomous, this is a test of the equality of the indirect effects at each level of positive affect (present versus absent). A confidence interval (95% in this test) excluding zero indicates significant moderated mediation.

\* A confidence interval (95% in this analysis) excluding zero indicates a significant effect.



collection practices, and a knowledge of the business environment in which a client operates (e.g., the client's ability to collect future cash flows from their customers). Prior research on depletion finds that individuals are less able to engage in such complex, critical thinking and reasoning when they are in a depleted state (e.g., Schmeichel et al. 2003). Thus, I expect that auditors' ability to identify conceptual errors during a workpaper review task is more likely to be negatively affected than their ability to identify mechanical errors.

The seeded errors included in the workpaper review task include six mechanical and four conceptual errors.<sup>13</sup> To capture the differential effect of depletion on the types of errors identified, I calculate the types of errors identified (conceptual or mechanical) as a proportion of the total number of errors identified for each participant. In other words, I calculate each participant's percentage of identified seeded errors that are conceptual (and then separately, mechanical) in nature. Thus, this measure captures the relative effectiveness in identifying each type of error, while controlling for idiosyncratic differences in total performance (i.e., total seeded errors identified). ANOVA results indicate a significant main effect of multi-tasking (i.e., depletion) on participants' relative error identification rates. ANOVA results indicate a significant main effect of multi-tasking (i.e., depletion) on participants' relative error identification rates. Specifically, participants who multi-task find a lower proportion of conceptual errors (22.9%) compared to participants who did not (31.6%; p-value 0.04; Table 8, Panels A and B). While the interaction is not significant, the ordered contrast is marginally significant ( $F = 2.33$ ; p-value = 0.065; non-tabulated) suggesting a pattern of results similar to the main results (i.e., positive affect moderating multi-tasking). Therefore, it appears that, when in a depleted state, auditors are less able to identify conceptual errors.

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<sup>13</sup> Owosho et al.'s (2002) findings suggest that audit seniors tend to find more mechanical, as opposed to conceptual errors.

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**TABLE 8****ANOVA - Percentage of Identified Seeded Errors that are Conceptual in Nature****Panel A: Mean**

	No Positive Affect	Positive Affect	Collapsed Across Positive Affect
Sequential	33.6% n=20	29.6% n=20	31.6% n=40
Multi-tasking	21.3% n=19	24.3% n=20	22.9% n=39
Collapsed Across Multi- Tasking	27.9% n=39	26.9% n=40	

**Panel B: ANOVA Results**

	F	p-value
Multi-tasking	4.23	0.043
Positive Affect	0.01	0.907
Multi-tasking*Positive Affect	0.68	0.414

All p-values are two-tailed.

---

Because estimation issues result when performing ANOVA or OLS regression using bounded response variables (0→1), I also perform a Tobit regression (Kieschnick and McCullough 2003). Inferences using this approach are the same (p-value = 0.02 on the main effect of multi-tasking; Table 9).

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**TABLE 9****Tobit - Percentage of Identified Seeded Errors that are Conceptual in Nature**

	<u>Coefficient</u>	<u>zValue</u>	<u>p-value</u>
(Intercept)	0.27	4.81	0.000
Multi-tasking	-0.19	-2.34	0.019
Positive Affect	0.67	0.80	0.466
Multi-tasking*Positive Affect	1.06	0.31	0.316

---

This table provides Tobit regression results of participants' percentage of identified seeded errors that are conceptual in nature. All p-values are two-tailed.

---

For additional evidence, I also consider the number of conceptual errors identified, mechanical errors identified, and workpaper comments which do not relate to an error, provided by all participants. As a frame of reference, there were 4 seeded conceptual errors and 6 seeded mechanical errors included in the workpaper review task. Participants were not limited on the total amount of workpaper comments that they could provide, other than by the amount of space on the workpaper. The pattern of means when isolating conceptual errors identified and mechanical errors identified are consistent with the hypotheses. Specifically, participants identified more conceptual errors and mechanical errors after completing the initial task in a sequential (1.53 conceptual, 3.20 mechanical) versus multi-tasking manner (0.92 conceptual, 2.67mechanical). This difference is significant for conceptual errors identified (p-value < 0.01; Table 10.1, Panel B), and significant for mechanical errors identified (p-value = 0.05; Table 10.2, Panel B). While the pattern of means is consistent with the prediction of hypothesis 2 (see Figure 2 for a depiction), the interaction is not significant when considering conceptual (p-value = 0.19; Table 10.1, Panel B) or mechanical errors as the dependent variable (p-value = 0.11; Table 10.2, Panel B).

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**TABLE 10.1****Seeded Conceptual Errors Identified****Panel A: Mean (Std. Dev.)**

	No Positive Affect	Positive Affect	Collapsed Across Positive Affect
Sequential	1.50 (0.89) n=20	1.55 (0.94) n=20	1.53 (0.91) n=40
Multi-tasking	0.63 (0.68) n=19	1.20 (0.95) n=20	0.92 (0.87) n=39
Collapsed Across Multi- Tasking	1.08 (0.90) n=39	1.38 (0.95) n=40	

**Panel B: ANOVA Results**

	F	p-value
Multi-tasking	9.54	0.003
Positive Affect	2.50	0.121
Multi-tasking*Positive Affect	1.73	0.193

---

This table provides descriptive statistics, and ANOVA results of the number of seeded conceptual errors identified by participants. All p-values are two-tailed.

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**TABLE 10.2****Seeded Mechanical Errors Identified****Panel A: Mean (Std. Dev.)**

	No Positive Affect	Positive Affect	Collapsed Across Positive Affect
Sequential	2.95 (1.36) n=20	3.45 (0.83) n=20	3.20 (1.14) n=40
Multi-tasking	1.95 (1.43) n=19	3.35 (1.23) n=20	2.67 (1.49) n=39
Collapsed Across Multi- Tasking	2.46 (1.47) n=39	3.40 (1.03) n=40	

**Panel B: ANOVA Results**

	F	p-value
Multi-tasking	3.97	0.050
Positive Affect	17.87	0.001
Multi-tasking*Positive Affect	2.66	0.107

---

This table provides descriptive statistics, and ANOVA results of the number of mechanical conceptual errors identified by participants. All p-values are two-tailed.

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In general, participants provided many workpaper comments that did not relate to errors seeded in the workpapers. Much of these additional comments related to workpaper stylization such as “please don’t write in first person”. Other additional comments related to firm guidance such as “reference related guidance from the firm audit manual”. Participants did not display significant differences, by experimental condition, in the number of additional workpaper comments provided. Specifically, there were no significant differences in the number of additional workpaper comments provided by participants who had previously multi-tasked versus sequentially completed the first two tasks (p-value = 0.46; Table 10.3, Panel B). Additionally, the presence of a positive affect intervention did not significantly influence the number of additional workpaper comments (p-value = 0.41; Table 10.3, Panel B).

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**TABLE 10.3****Additional Workpaper Comments Provided****Panel A: Mean (Std. Dev.)**

	No Positive Affect	Positive Affect	Collapsed Across Positive Affect
Sequential	5.35 (3.41) n=20	4.80 (2.19) n=20	5.08 (2.84) n=40
Multi-tasking	3.84 (2.19) n=19	5.40 (2.82) n=20	4.64 (2.62) n=39
Collapsed Across Multi- Tasking	4.62 (2.94) n=39	5.10 (2.51) n=40	

**Panel B: ANOVA Results**

	F	p-value
Multi-tasking	0.56	0.458
Positive Affect	0.69	0.411
Multi-tasking*Positive Affect	3.00	0.088

---

This table provides descriptive statistics, and ANOVA results of the number of additional workpaper comments provided by participants. All p-values are two-tailed.

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### ***Task Familiarity, Experience, and Motivation***

Prior psychology research shows that task familiarity, experience, and motivation all can moderate depletion effects (Muraven and Slessareva 2003). However, I am unaware of any studies utilizing professionals that test for the effect of these potential moderators. Measuring these factors is an important empirical concern in this context as auditors are highly motivated to appropriately complete audit tasks because of accountability through workpaper review and annual performance evaluations (Brazel et al. 2004; McNair 1991). Additionally, audit firms employ a highly systematic approach to planning, performing, and reviewing engagements, likely resulting in opportunity for task familiarity (Messier et al. 2014). While random assignment of participants should reduce the concern that the level of these factors is higher in any one cell over another, there is at least a possibility that one or more of these factors may interact with the manipulations. I include a series of self-reported measures in the post-experiment questionnaire designed to capture and test for any such effects. In an analysis of variance, there is no significant effect of *multi-tasking*, *positive affect*, or *multi-tasking x positive affect* on task familiarity, experience, or motivation (see Tables 11.1 - 11.3).



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**TABLE 11.1****Univariate Results: Task Familiarity****Panel A: Mean (Std. Dev.)**

	<u>No Positive Affect</u>	<u>Positive Affect</u>	<u>Collapsed Across Positive Affect</u>
Sequential	7.65 (1.09) n=20	7.30 (1.56) n=20	7.48 (1.34) n=40
Multi-tasking	7.21 (2.12) n=19	7.80 (1.44) n=20	7.51 (1.80) n=39
Collapsed Across Multi- Tasking	7.44 (1.67) n=39	7.55 (1.50) n=40	
Overall	7.45 (1.60) n=79		

**Panel B: ANOVA Results**

	<u>F</u>	<u>p-value</u>
Multi-tasking	0.09	0.933
Positive Affect	0.07	0.739
Multi-tasking*Positive Affect	1.58	0.193

---

This table provides descriptive statistics and ANOVA results of participants' self-assessed level of experience related to workpaper review tasks, on a scale from 1 (not experienced at all) to 9 (very experienced). All p-values are two-tailed.

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**TABLE 11.2****Univariate Results: Experience****Panel A: Mean (Std. Dev.)**

	<u>No Positive Affect</u>	<u>Positive Affect</u>	<u>Collapsed Across Positive Affect</u>
Sequential	46.6 (4.72) n=20	47.9 (7.98) n=20	47.25 (6.51) n=40
Multi-tasking	48.17 (5.39) n=19	53.00 (14.32) n=20	50.71 (11.17) n=39
Collapsed Across Multi- Tasking	47.34 (5.05) n=39	50.45 (11.74) n=40	
Overall	48.94 (9.19) n=79		

**Panel B: ANOVA Results**

	<u>F</u>	<u>p-value</u>
Multi-tasking	2.65	0.108
Positive Affect	2.25	0.138
Multi-tasking*Positive Affect	0.75	0.391

---

This table provides descriptive statistics and ANOVA results of total months of audit experience. All p-values are two-tailed.

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**TABLE 11.3****Univariate Results: Motivation****Panel A: Mean (Std. Dev.)**

	<u>No Positive Affect</u>	<u>Positive Affect</u>	<u>Collapsed Across Positive Affect</u>
Sequential	4.80 (2.02) n=20	5.40 (2.14) n=20	5.10 (2.07) n=40
Multi-tasking	5.41 (2.61) n=19	5.70 (2.08) n=20	5.56 (2.33) n=39
Collapsed Across Multi- Tasking	5.10 (2.31) n=39	5.55 (2.09) n=40	
Overall	5.33 (2.20) n=79		

**Panel B: ANOVA Results**

	<u>F</u>	<u>p-value</u>
Multi-tasking	0.85	0.359
Positive Affect	0.78	0.381
Multi-tasking*Positive Affect	0.10	0.749

---

This table provides descriptive statistics and ANOVA results of participants' self-assessed level of motivation related to the third audit task, workpaper review, on a scale from 1 (not motivated at all) to 9 (very motivated). All p-values are two-tailed.

---

Further, I test the moderating effect of these variables. The inclusion of these variables, individually or together, as covariates in the main analysis, does not change the inferences associated with hypothesis testing (see Tables 12.1 - 12.2). Prior psychology research also suggests that depletion effects may differ depending on gender. The inclusion of gender as a covariate does not change the inferences associated with hypothesis testing (see Tables 12.1 - 12.2).

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**TABLE 12.1**

**ANOVA Results including all Covariates: Task Familiarity, Experience, Motivation, and Gender**

	F	p-value
Task Familiarity	0.83	0.566
Audit Experience	0.37	0.795
Motivation	3.95	0.019
Gender	0.29	0.550
Multi-tasking	8.95	0.001*
Positive Affect	8.15	0.002*
Multi-tasking*Positive Affect	3.33	0.036*

---

This table provides ANOVA results of the number of seeded errors identified by participants. P-values marked with an \* are one-tailed, consistent with directional hypothesis.

---

---

**TABLE 12.2****ANOVA Results including individual Covariates: Task Familiarity, Experience, Motivation, and Gender****Panel A: Task Familiarity included as a covariate**

	<u>F</u>	<u>p-value</u>
Task Familiarity	0.01	0.962
Multi-tasking	11.02	0.001*
Positive Affect	12.97	0.001*
Multi-tasking*Positive Affect	4.01	0.025*

**Panel B: Audit Experience included as a covariate**

	<u>F</u>	<u>p-value</u>
Audit Experience	0.27	0.871
Multi-tasking	9.67	0.002*
Positive Affect	11.18	0.001*
Multi-tasking*Positive Affect	3.29	0.037*

**Panel C: Motivation included as a covariate**

	<u>F</u>	<u>p-value</u>
Motivation	4.05	0.048
Multi-tasking	12.98	0.001*
Positive Affect	12.11	0.001*
Multi-tasking*Positive Affect	4.67	0.017*

**Panel D: Gender included as a covariate**

	<u>F</u>	<u>p-value</u>
Gender	0.53	0.468
Multi-tasking	11.01	0.001*
Positive Affect	11.85	0.001*
Multi-tasking*Positive Affect	3.56	0.037*

---

This table provides ANOVA results of the number of seeded errors identified by participants. P-values marked with an \* are one-tailed, consistent with directional hypothesis.

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## ***Mental Fatigue***

A meta-analysis of nearly 100 self-control depletion studies (Hagger et al. 2010) provides evidence that subjective fatigue (i.e., participants' self-report measures of fatigue) also increases in self-control depleting conditions. Inspection of the self-report measures included in the meta-analysis reveals that physical fatigue likely is the construct captured by such measures. These studies generally include one question in which participants indicate how tired they felt after the study (e.g., Baumeister et al. 1998; Pocheptsova et al. 2009). While physical fatigue likely coincides with some causes of depletion, the present study does not manipulate physical exertion between conditions. Mental fatigue differs from the self-report measures of subjective fatigue generally found in ego depletion literature, and can be defined as a change in psycho-physiological state due to sustained performance (Linden et al. 2003). To rule out mental fatigue induced by the preparer tasks as a potential confound with the multi-tasking manipulation, I examine the mean self-reported time measures provided by participants across experimental conditions. Time spent on task is a common proxy for mental fatigue in psychology research (e.g., Linden et al. 2003; Ackerman and Kafner 2009). The overall mean time spent on the preparer tasks is 16.5 minutes. In an analysis of variance, there is no significant effect of multi-tasking on the time spent on the preparer tasks ( $p$ -value = 0.42, nontabulated). Accordingly, it appears that the multi-tasking manipulation is not confounded with mental fatigue.

### ***Correlation Matrices***

Table 13 presents a streamlined correlation matrix which details the correlations between each independent variable and all of the dependent, additional analysis, and demographic variables. Table 14 presents the correlation matrix for all of the dependent, additional analysis, and demographic variables.

**TABLE 13**

**Streamlined Correlation Matrix - Independent Variables by Dependent, Additional, and Demographic Variables**

	Multi-Tasking	Positive Affect
Seeded	-.30***	.34***
Comments	-.18	.28**
Conceptual	-.32***	.11
Mechanical	-.17	.37***
Other	.03	.12
Self-Control	-.28**	.29**
Mood	-.35***	.46***
NFC	.39***	.02
SURL	.12	.06
IC	.11	.04
Review	.04	.03
Motiv	.12	.10
Months	.17	.15
Pub	-.04	.04
Gen	-.01	-.15

\* Significant at the  $p < 0.10$  level; \*\* Significant at the  $p < 0.05$  level; \*\*\* Significant at the  $p < 0.01$  level. All p-values two-tailed.

*Multi-tasking* = 1 for participants in the multi-tasking conditions, 0 otherwise

*Positive Affect* = 1 for participants in the positive affect conditions, 0 otherwise

*Seeded* = number of seeded errors identified by participants

*Comments* = total number of workpaper review comments provided by participants

*Conceptual* = total number of seeded conceptual errors identified by participants

*Mechanical* = total number of seeded mechanical errors identified by participants

*Other* = total number of workpaper comments provided by participants, excluding seeded conceptual and mechanical errors

*Self-Control* = total number of differences identified by participants on two spot-the-difference puzzles

*Mood* = participants' combined responses on the Brief Mood Introspection Scale

*NFC* = participants' self-assessed extent of thought, on a scale from 1-9, about task 2 while performing task 3

*SURL* = participants' self-assessed experience level, on a scale from 1-9, with the audit task: search for unrecorded liabilities

*IC* = participants' self-assessed experience level, on a scale from 1-9, with the audit task: internal control testing

*Review* = participants' self-assessed experience level, on a scale from 1-9, with the audit task: workpaper review

*Motiv* = participants' self-assessed motivation, on a scale from 1-9, for accomplishing the workpaper review task

*Months* = participants' number of months of audit experience

*Pub* = percentage of time spent auditing public clients as reported by participants

*Gen* = 1 for male, 0 for female



Table 14

Correlation Matrix - All Dependent, Additional, and Demographic Variables

	Seeded	Comm	Conc	Mech	Other	Self-Control	Mood	NFC	SURL	IC	Review	Motiv	Months	Pub	Gen
Seeded	1	.62***	.65***	.86***	.11	.78***	.30***	-.13	-.11	-.01	.00	.15	.08	.10	-.16
Comments	.62***	1	.46***	.49***	.85***	.56***	.33***	.02	-.10	.06	-.05	.20*	-.03	.13	-.27**
Conceptual	.65***	.46***	1	.17	.15	.51***	.10	-.28	-.17	.00	.127	.07	.016	.24**	-.03
Mechanical	.86***	.49***	.17	1	.04	.67***	.32***	.02	-.02	-.02	-.08	.15	.09	-.03	-.19
Other	.11	.85***	.15	.04	1	.19	.22	.12	-.05	.09	-.06	.15	-.08	.10	-.24**
Self-Control	.78***	.56***	.51***	.67***	.19	1	.34***	-.30**	-.02	-.02	-.10	.18	.06	.02	-.04
Mood	.30**	.33***	.10	.32***	.22*	.34***	1	-.20*	.02	.07	-.04	.21*	.01	.17	-.08
NFC	-.13	.02	-.28**	.02	.12	-.28	-.20*	1	.01	.11	-.12	-.17	-.22*	-.05	-.21*
SURL	-.11	-.10	-.17	-.02	-.05	-.02	.02	.01	1	.35***	.19	.19*	.19	-.19*	.08
IC	.01	.06	.00	-.02	.09	-.02	.07	.11	.35***	1	.19	.34***	.18	.28**	.02
Review	.00	-.05	.13	-.08	-.06	-.10	-.04	-.12	.19	.19	1	-.10	.30**	.25**	-.06
Motiv	.15	.20*	.07	.15	.15	.18	.21*	-.17	.19*	.34***	-.10	1	.10	.16	-.02
Months	.08	-.03	.02	.09	-.08	.06	.01	-.22*	.19	.18	-.30	.10	1	.05	-.05
Pub	.10	.13	.24**	-.03	.10	.02	.17	-.05	-.19*	.28-	.25*	.16	.05	1	-.02
Gen	-.16	-.27**	-.03	-.19	-.24**	-.04	-.08	-.21*	.08	.02	-.06	-.02	-.05	-.02	1

\* Significant at the p<0.10 level; \*\* Significant at the p<0.05 level; \*\*\* Significant at the p<0.01 level. All p-values two-tailed.

*Seeded* = number of seeded errors identified by participants

*Comments* = total number of workpaper review comments provided by participants

*Conceptual* = total number of seeded conceptual errors identified by participants

*Mechanical* = total number of seeded mechanical errors identified by participants

*Other* = total number of workpaper comments provided by participants, excluding seeded conceptual and mechanical errors

*Self-Control* = total number of differences identified by participants on two spot-the-difference puzzles

*Mood* = participants' combined responses on the Brief Mood Introspection Scale

*NFC* = participants' self-assessed extent of thought, on a scale from 1-9, about task 2 while performing task 3

*SURL* = participants' self-assessed experience level, on a scale from 1-9, with the audit task: search for unrecorded liabilities

*IC* = participants' self-assessed experience level, on a scale from 1-9, with the audit task: internal control testing

*Review* = participants' self-assessed experience level, on a scale from 1-9, with the audit task: workpaper review

*Motiv* = participants' self-assessed motivation, on a scale from 1-9, for accomplishing the workpaper review task

*Months* = participants' number of months of audit experience

*Pub* = percentage of time spent auditing public clients as reported by participants

*Gen* = 1 for male, 0 for female

## CHAPTER 5

### CONCLUSION

Multi-tasking has become more common in auditing because of improvements in information technology that allow auditors to work on multiple tasks and even multiple clients concurrently. Prior audit studies find that auditors are subject to limitations and errors *during* multi-tasking (e.g., Lindberg and Maletta 2003; Bhattacharjee et al. 2007). This study demonstrates, based on Ego Depletion Theory, that auditors who multi-task exhibit impaired judgment quality that lasts *beyond* the multi-tasking tasks because of a diminished ability to cognitively focus (i.e., self-control). However, a positive affect intervention replenishes auditors' cognitive focus, yielding improved judgment quality (i.e., mitigates impaired judgment quality associated with depletion).

#### **Limitations**

This study is subject to certain limitations. First, given the experimental environment, typical pressures and incentives inherent in auditing are not present. Additionally, during an audit engagement, audit seniors' judgments and decisions are typically subject to review by a superior. While the participants in this study knew that their work would not be reviewed and no actual review occurred, the instructions asked them to assume that such a review would occur. Second, psychology research on depletion finds that motivation, task familiarity, and experience moderate the effect of depletion. While experience, task familiarity, and self-assessed motivation did not moderate the depletion effects in this study, this may be because the participants were

quite homogenous with regards to these characteristics. Future research could further investigate how differences in these characteristics influence depletion effects in auditing. Finally, self-control is a latent variable. Thus, direct measurement of individuals' level of self-control resources is not possible. In this study, I use participants' performance on a puzzle task as a proxy for self-control since persistence on an undesirable task requires self-control (Muraven and Slessereva 2003). Future research could validate the appropriateness of this measure as a proxy for self-control.

### **Further Research Opportunities**

This study's findings suggest a need for further research into the role of self-control in auditing. While I focus on the depleting effects of multi-tasking, future research could identify other causes of depletion in auditing. This is especially important given that depletion theory indicates that depletion effects are most pronounced for individuals who use high levels of cognitive resources (e.g., Schmeichel et al. 2003), such as that required in auditing. As noted previously, the audit environment likely includes many causes of depletion, such as resisting the temptation to accept the status quo, maintaining a questioning mind, and critically assessing audit evidence.

Additionally, this is the first study to identify an intervention to mitigate the negative effects of depletion in an audit environment. Prior psychology research has found that other mechanisms exist, such as short periods of rest and relaxation, rewards, and glucose supplementation, that can have a replenishing effect on one's self-control resources. Given this study's findings that decrements in self-control lead to a reduction in auditors' judgment quality,

identification of other methods that auditors could employ to overcome depletion effects has direct implications for improving audit quality.

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APPENDIX A  
RESEARCH INSTRUMENT

This appendix presents the research instrument provided to participants in the multi-tasking/positive affect condition only.

### Research Invitation

You are being asked to participate in a research study. Curtis Mullis, Principal Investigator from The University of Alabama, is interested in further understanding auditor testing and auditor review decisions. This case will simulate some typical audit tasks. You will be provided with hypothetical audit scenarios and asked to make decisions and conclusions regarding testwork. Please be assured that all responses will be held in **strict confidence**. Participation is voluntary. You are free not to participate or to quit the study prior to completion. Only the investigators will have access to the data, no data will include any identifying information, and no attempt will be made to attribute responses to individuals. Only summarized data will be presented at meetings or in publication. The study should take you around 45 total minutes to complete.

By completing the research case, and providing your responses, you freely provide consent and acknowledge your rights as a voluntary participant. The findings from this study will contribute to a better understanding of the auditing environment and will be useful to the accounting research community. There are no direct risks to you related to completing this study.

Please assume that you are an audit senior assigned to the 2013 audit engagement for Wareham Electronics, Inc.

When completing the case, please keep in mind that there are no correct answers other than your honest perceptions about the information provided. Please also be aware that the case is not intended to include all of the information that would be available if you were in a real-world situation. Therefore, for purposes of this study, base your judgments only on the information provided.

If you have questions about the research study, please contact the principal investigator, Curtis Mullis at (205) 348-0150, or his faculty advisor Rick Hatfield at (205) 348-2901.

If you understand the statements above, are at least 19 years old, and freely consent to be in this study, please proceed with the research case.

Thank you very much for your consideration.

Sincerely,

Curtis Mullis, CPA

If you have questions about your rights as a person taking part in a research study, make suggestions or file complaints and concerns, you may call Ms. Tanta Myles, the Research Compliance Officer of the University at (205)-348-8461 or toll-free at 1-877-820-3066. You may also ask questions, make suggestions, or file complaints and concerns through the IRB Outreach Website at [http://osp.ua.edu/site/PRCO\\_Welcome.html](http://osp.ua.edu/site/PRCO_Welcome.html). You may direct emails to [participantoutreach@bama.ua.edu](mailto:participantoutreach@bama.ua.edu)

# Auditor Booklet

## Introduction

This case will simulate some typical audit tasks. You will be provided with audit scenarios and asked to make decisions and conclusions regarding testwork. You will be asked to take on the role of an audit senior in each of the scenarios presented.

When completing the case, please keep in mind that there are no correct answers other than your honest perceptions about the information provided. Please also be aware that the case is not intended to include all of the information that would be available if you were in a real-world situation. Therefore, for purposes of this study, base your judgments only on the information provided.

Please be assured that all responses will be held in strict confidence. All results from this study will be presented in the aggregate. Only the principal investigator will have access to the data. Your participation is completely voluntary. You are free not to participate or to quit the study prior to completion.

In the Auditor Booklet you will find the audit workpapers necessary to document the audit procedures related to your assigned audit tasks. The Auditor Booklet will also provide instructions to open numbered envelopes which include source documents necessary to complete your testing. Please open these envelopes **only when instructed to do so** in numerical order, as noted on the outside of the envelopes.

Throughout the case, you will be asked to report the current time when either beginning or finishing a task. Please reference the **large clock** provided by the experimenter and located at the front of the room to fulfill this request.

Please turn the page for Task 1 instructions

**Please record the current time \_\_\_\_\_**

### **General Information**

Task 1 involves audit testing for one of your audit clients, Wareham Electronics, Inc. (Wareham). Wareham is an electronics manufacturer that sells electronic products to third-party retail centers in the United States. Wareham is an SEC registrant and its stock is traded on the New York Stock Exchange. Your firm has audited Wareham for the past five (5) years and you have served on the audit team for the past two (2) years. As in prior years, Wareham has experienced current year pretax income that is consistent with industry averages. Based on planning and control testing, there has been no indication for the audit team to increase the audit risk for the current year.

### **Audit Task #1 Instructions**

**You have been assigned to Accounts Payable testwork. Specifically, you have been asked to complete testwork on a Search for Unrecorded Liabilities.** The audit manager has asked you to review a sample of disbursements made after year-end in order to determine whether these disbursements should be included in accounts payable as of December 31, 2013. Please note that another staff on the audit team has already begun this audit procedure and you are being asked to complete the task. You should assume that the other audit staff has not made any errors in the previous testing.

For each selected disbursement, you will need to examine the related invoice. The invoice includes a date stamp indicating when the goods were received by the company. If the items were received on or before 12/31/13, then the invoice amount should be included in the Accounts Payable detail as of 12/31/13. If the items were received after 12/31/13, then the invoice amount should not be included in the Accounts Payable detail as of 12/31/13.

Please document your testing on the provided audit workpaper (next page). Please complete all cells highlighted in blue.

Source documents necessary to complete the search for unrecorded liabilities can be found in Envelope 1. You may open that envelope now.

Please proceed with your testing.



Search for Unrecorded Liabilities  
Wareham Electronics, Inc.  
December 31, 2013

Payment Date	Vendor Name	Invoice Number	Invoice Date	Amount	Check No.	Received Date	Expense related to 2013?	Amount Properly Included	Amount Properly Excluded	Amount Improperly Included	Amount Improperly Excluded	Audit Difference
1 2/19/2014	Lansing Electronics	212318	12/26/2013	\$ 360,991	52973	1/3/2014	No	\$ -	\$ 360,991	-	-	-
2 1/16/2014	Alliance Systems	166715	1/25/2014	\$ 320,800	53039	2/16/2014	No	-	\$ 320,800	-	-	-
3 1/20/2014	BonComp Suppliers	117404	1/24/2014	\$ 259,323	53035	1/26/2014	No	-	\$ 259,323	-	-	-
4 1/19/2014	California Wholesale Group	66154	2/2/2014	\$ 289,295	53068	2/8/2014	No	-	\$ 289,295	-	-	-
5 1/10/2014	Lansing Electronics	160699	2/6/2014	\$ 141,529	53081	2/19/2014	No	-	\$ 141,529	-	-	-
6 2/7/2014	Williams, Inc.	155395	12/18/2013	\$ 84,035	52955	12/30/2013	Yes	-	-	\$ 84,035	-	\$ 84,035
7 1/22/2014	Lansing Electronics	237545	1/26/2014	\$ 449,115	53047	2/13/2014	No	-	\$ 449,115	-	-	-
8 2/13/2014	Regue Beacon	240687	1/8/2014	\$ 345,244	53002	1/11/2014	No	-	\$ 345,244	-	-	-
9 1/19/2014	Brett, James, Bkfst, LLC	272612	1/10/2014	\$ 497,107	53009	1/19/2014	No	-	\$ 497,107	-	-	-
10 1/18/2014	Terra True	248081	12/15/2013	\$ 278,492	52942	12/23/2013	Yes	\$ 278,492	-	-	-	-
11 1/27/2014	Lopez Supply Company	3201-WEI	1/4/2014	\$ 52,299	52989							
12 1/29/2014	Smith Fabricators	52956	12/12/2013	\$ 797,554	52930							
13 2/15/2014	Colonial Group	37700	2/10/2014	\$ 96,769	53103							
14 2/2/2014	Masahuro Electronics	52142	1/10/2014	\$ 710,584	53011							
15 2/6/2014	American Metals	58008	2/4/2014	\$ 807,814	53076							
16 2/17/2014	Resin Resources	64322	2/2/2014	\$ 774,560	53069							
17 2/18/2014	Small Parts Electronics, Inc.	35229	2/10/2014	\$ 441,663	53105							
18 1/30/2014	Templeberry	17700	1/22/2014	\$ 81,507	53030							
19 2/18/2014	Fireside Logistics	4169	2/15/2014	\$ 324,523	53122							
20 1/11/2014	Masahuro Electronics	13698	12/17/2013	\$ 416,305	52946							

**Please record the current time \_\_\_\_\_**

### **General Information**

Task 2 involves testing internal controls for another one of your audit clients, LD Corp. LD Corp. operates 435 Home Infusion Pharmacies around the country and is listed on the New York Stock Exchange. Your firm has audited LD Corp. for the past eight (8) years and you have served on the audit team for the past two (2) years. As in prior years, LD Corp. has experienced current year pretax income that is consistent with industry averages. Based on planning, there has been no indication for the audit team to increase the audit risk in the current year. Please note that LD Corp. is not related in any way to your other audit client, Wareham, Inc. As such, the results of your audit testing of LD Corp.'s internal controls should not in any way inform the subsequent testing you will perform on Wareham, Inc. (and vice-versa).

### **Audit Task #2 Instructions**

You have been assigned to test the operating effectiveness of LD Corp.'s internal control that requires two authorized signatures on all checks greater than \$10,000. **The allowable number of deviations for this test is 1.** Authorized signors are:

- Chad Stefaniak
- Andrew Wright
- Gregory Wilkes
- Jimmy Smith

Your team has decided a sample size of 20 is appropriate for this testing. Please note that another auditor on the audit team has already begun this audit procedure and you are being asked to complete the task. You should assume that the other auditor has not made any errors in the previous testing.

Please document your testing on the provided audit workpaper (next page). Please complete all cells highlighted in blue.

To perform testing, you will need to examine cleared checks and verify whether there are two authorized signatures. If a check contains two authorized signatures, you should write *Yes* in the column labeled "Dual Signatures" for that disbursement. If the check does not contain two authorized signatures, this is considered a deviation from the prescribed control and you should write *No* in the column labeled "Dual Signatures" for that disbursement.

**It is important to note that if you identify MORE than one deviation, then you will need to notify the instructor, who will provide you an additional 10 disbursements for testing.**

Source documents necessary to complete the internal control testing can be found in Envelope 2. You may open that envelope now.

Please proceed with your testing.

**LD Corp.**  
**IC Testing - Cash Disbursements**  
**12/31/2013**

	<b>Check No.</b>	<b>Amount</b>	<b>Date</b>	<b>Dual Signatures:</b>
1	37114	\$ 39,609	4/7/2013	YES
2	37128	\$ 24,854	4/11/2013	YES
3	37134	\$ 33,302	4/16/2013	YES
4	37147	\$ 41,542	4/19/2013	YES
5	37149	\$ 16,867	4/19/2013	YES
6	37168	\$ 33,542	4/26/2013	YES
7	37181	\$ 35,728	4/29/2013	YES
8	37183	\$ 37,116	4/29/2013	YES
9	37194	\$ 34,901	5/3/2013	
10	37196	\$ 17,616	5/3/2013	
11	37211	\$ 24,321	5/13/2013	
12	37258	\$ 17,708	5/16/2013	
13	37270	\$ 45,461	5/21/2013	
14	37294	\$ 16,127	5/24/2013	
15	37296	\$ 11,048	5/24/2013	
16	37313	\$ 47,014	5/27/2013	
17	37344	\$ 29,273	6/2/2013	
18	37352	\$ 46,063	6/7/2013	
19	37363	\$ 16,027	6/9/2013	
20	37398	\$ 12,152	6/25/2013	

Conclusion: Is the control operating effectively? (yes/no)

### A note from the instructor

Thank you once again for your participation in this study. As a former auditor myself (I spent five years in public accounting), I understand how critical audit seniors are to every audit engagement. **You are the front-line control over the cost and quality of auditing.** My aim with this study is to better understand how you complete audit procedures, with an ultimate aim of **improving the audit industry.** Your performance in this study will help meet this goal. Additionally, during my conversations with your audit firm, they have identified your group of seniors as **audit experts** who are qualified to complete this study.

**INSTRUCTIONS:** Circle the response on the scale below that indicates how well each adjective or phrase describes your present mood:

	Definitely do not feel	Do not feel	Slightly feel	Definitely feel
	1	2	3	4
Happy	1	2	3	4
Sad	1	2	3	4
Caring	1	2	3	4
Content	1	2	3	4
Grouchy	1	2	3	4
Calm	1	2	3	4
Irritated	1	2	3	4

Overall my mood is:

Very Unpleasant Very Pleasant

-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10

**Please record the current time \_\_\_\_\_**

After completing the above questions, please turn to the next page which contains instructions for the final task.

### **Audit Task #3 Instructions**

The third audit task is concerned with the role of the audit review process in detecting material misstatements. Specifically, this task relates to the audit of accounts receivable (including the allowance for doubtful accounts) for Wareham Electronics, Inc. You have been asked to **REVIEW WORKPAPERS** prepared by a first-year staff auditor and complete the following:

1. Review the workpapers which include a partial audit program for accounts receivable, unaudited balance sheet and income statement, and a staff auditor's working papers which include a lead sheet, schedules, audit memo, and conclusions.
2. Prepare any necessary **review notes or comments** using the preprinted workpaper that is provided in this packet (*on the next page*).

You may assume that workpapers that are **NOT** included in this packet are properly prepared and references to these working papers are correct. Additionally, in the interest of time, you can assume there are **NO FOOTING OR CROSS-FOOTING ERRORS**.

As an audit senior, you are aware that your work may be reviewed by the audit manager or partner on the engagement.

The workpapers necessary to complete this review task can be found in **Envelope 5**. You may open that envelope now.

Please proceed with your review.

**Wareham Electronics, Inc.**  
**Accounts Receivable/Allowance for Doubtful Accounts**  
**REVIEW NOTES**  
**FYE 12/31/13**

W/P Ref No	REVIEW NOTES



The following questionnaire should be completed **after** you complete Audit Task #3 (Workpaper review). If you have not yet completed that task, please return to the review task before beginning this questionnaire.

## Questionnaire

---

**INSTRUCTIONS:** Please respond to the short list of questions below (**Again, all of your responses are confidential**):

---

- 1) Please recall the first two audit tasks you engaged in during this study (i.e., a search for unrecorded liabilities and internal controls testing). Please circle the response below that reflects your experience in completing these two tasks.
  - a) I was **able** to complete the search for unrecorded liabilities task before beginning the internal control testing task.
  - b) I was **unable** to complete the search for unrecorded liabilities task before beginning the internal control testing task (i.e., I had to go back and forth between the two tasks).
- 2) Were you able to complete the internal controls testing?
  - a) **Yes**. I completed the internal controls testing.
  - b) **No**. I did not complete the internal controls testing. It is still an “open item”.
- 3) To what extent did you think about the potential internal control failure (i.e., task 2) while you completed the workpaper review task (i.e., task 3)?

Not at all								Very much
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)

- 4) Please indicate your experience (i.e., familiarity) with the three audit tasks you completed in this study by placing an X in the appropriate box:

	Not experienced at all (1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	Very experienced (9)
Search for unrecorded liabilities									
Internal control testwork									
Workpaper review									

- 5) When you got to the third audit task (workpaper review), how motivated were you to accomplish this task? Indicate your motivation by placing an X in the appropriate box:

Not motivated at all (1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	Very motivated (9)

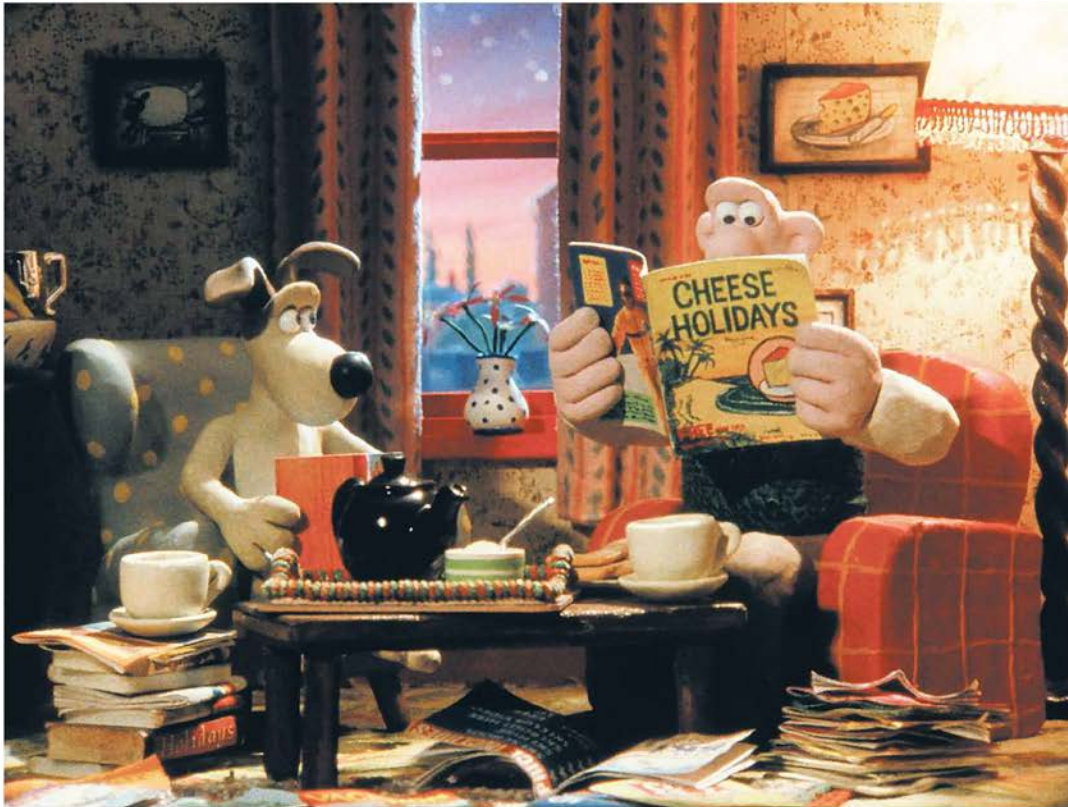
- 6) How many total **MONTHS** of audit experience do you have? \_\_\_\_\_ **MONTHS**

- 7) In a given year, what percentage of your time is typically spent auditing public clients?  
\_\_\_\_\_ %

- 8) Gender (please circle):

- Male
- Female

**INSTRUCTIONS:** Following are two traditional “Spot the Difference” puzzles. The goal in such puzzles is to identify differences between two otherwise similar images. **Please circle any differences you find.** While these puzzles are solvable, we realize that they can be quite challenging. We have no strict requirements for whether or how much of the puzzles you complete. Please do your best and solve as much of these puzzles as you can. **PUZZLE 1:**



15



PUZZLE 2:





You have now completed the audit case. Thank you very much for your help. Again, all data will be aggregated, and individual responses will be both anonymous and confidential. If you have questions concerning this audit case, please contact the researcher.

Please place all study materials back in to the corresponding envelopes and hand the materials to the instructor.

**Thank you very much for participating in this study!**

## ENVELOPE 1



**Wareham Electronics, Inc.**  
**AP Detailed Listing**  
**As of December 31, 2013**

<u>Vendor Name</u>	<u>Invoice</u>	<u>Amount</u>
Alliance Systems	AS-872	\$ 60,210
Colonial Group	28291	\$ 43,250
Creative Business Accessories	000521	\$ 36,000
Dimensions, Co.	1000546089	\$ 1,086
Electric Company	X8073	\$ 12,844
Emporium Reseller	11386	\$ 910,334
Equitable Insurance Company	79421W	\$ 98,502
Global Xpress	802435	\$ 794
Lansing Electronics	FRE-8648	\$ 6,418,790
Local Gas & Supply	1248-695-00	\$ 6,849
Masahuro Electronics	13698	\$ 416,305
Rogue Beacon	WEI-12468	\$ 4,710,324
Sierra Supply	8946	\$ 3,450,876
Smith Fabricators	52956	\$ 797,554
Terra True	248081	\$ 278,492
Thompson Tri-State	54135884	\$ 1,824,398
Universal Incorporated	AU-376.89	\$ 287,634
Water Company	MSCSD+234	\$ 2,387
Webber James	343219	\$ 262,143
Young Block Co., Inc.	78420012056	\$ 383,461

\$ 20,002,233

**Lopez Supply Company**

21020 Denmead Mill Road  
 Marietta, GA 30064  
 Phone [509.555.0190] Fax [509.555.0191]

**INVOICE**

INVOICE #3201-WEI  
 DATE: JANUARY 4, 2014

**TO:**

Wareham Electronics, Inc.  
 405 College Street  
 Scotch Plains, NJ 07076

**SHIP TO:**

Wareham Electronics, Inc.  
 405 College Street  
 Scotch Plains, NJ 07076

**COMMENTS OR SPECIAL INSTRUCTIONS:**

SALESPERSON	P.O. NUMBER	REQUISITIONER	SHIPPED VIA	F.O.B. POINT	TERMS
George Ruch	321	Amanda Beck	Ground	Destination	2/10, N/30

QUANTITY	DESCRIPTION	UNIT PRICE	TOTAL
30	Mirra 2 Chair – Teal/Blue	\$599.99	\$35,999.40
10	Nelson X-Leg Table	\$829.99	\$8,299.90
40	Wishbone Monitor Support	\$199.99	\$7,999.60
<b>Received By:</b>			
<i>Christine Johnson</i>			
<i>1/18/14</i>			
SUBTOTAL			\$52,298.90
SALES TAX			
SHIPPING & HANDLING			
TOTAL DUE			\$52,298.90

Make all checks payable to Lopez Supply Company  
 Payments are due within 30 days.  
 If you have any questions concerning this invoice, contact George Ruch at (509) 555-0190

Thank you for your business!

**Smith Fabricators**

21 Industrial Road  
Mesa, AZ 85203

**INVOICE**

INVOICE #52956  
DATE: DECEMBER 12, 2013

**TO:**

Wareham Electronics, Inc.  
405 College Street  
Scotch Plains, NJ 07076

**SHIP TO:**

Wareham Electronics, Inc.  
405 College Street  
Scotch Plains, NJ 07076

**COMMENTS OR SPECIAL INSTRUCTIONS:**

SALESPERSON	REQUISITIONER	SHIPPED VIA	F.O.B. POINT	TERMS
Jimmy Smith	Amanda Beck	Ground	Destination	2/10, N/30

QUANTITY	DESCRIPTION	UNIT PRICE	TOTAL
1	Fabricated machinery	\$797,554.00	\$797,554.00
<p><b>Received By:</b></p> <p><i>Christine Johnson</i></p> <p>12/20/13</p>			
		SUBTOTAL	\$797,554.00
		SALES TAX	
		SHIPPING & HANDLING	
		TOTAL DUE	\$797,554.00

Make all checks payable to Smith Fabricators  
Payments are due within 30 days.  
If you have any questions concerning this invoice, contact Jimmy Smith  
  
Thank you for your business!

**Colonial Group**

2500 State Road 67  
Wilmington, NC 28409

**INVOICE**

INVOICE #37700  
DATE: FEBRUARY 10, 2014

**TO:**

Wareham Electronics, Inc.  
405 College Street  
Scotch Plains, NJ 07076

**SHIP TO:**

Wareham Electronics, Inc.  
405 College Street  
Scotch Plains, NJ 07076

**COMMENTS OR SPECIAL INSTRUCTIONS:**

SALESPERSON	REQUISITIONER	SHIPPED VIA	F.O.B. POINT	TERMS
Joe Anderson	Amanda Beck	Ground	Destination	2/10, N/30

QUANTITY	DESCRIPTION	UNIT PRICE	TOTAL
10	Sheets High Poly Plastic	\$1,500.00	\$15,000.00
6	Coils	\$12,410.83	\$74,464.98
23	16" steel rod tensioners	\$278.00	\$6,394.00
14	Gallons Resin	\$65.00	\$910.00
<b>Received By:</b>			
<i>Christine Johnson</i>			
2/24/14			
SUBTOTAL			\$96,768.98
SALES TAX			
SHIPPING & HANDLING			
TOTAL DUE			\$96,768.98

Make all checks payable to Colonial Group  
Payments are due within 30 days.  
If you have any questions concerning this invoice, contact Jimmy Smith  
  
Thank you for your business!

**Masaharu Electronics**

128 Commerce Blvd.  
Monterey CA 93940

**INVOICE**

INVOICE #52142  
DATE: JANUARY 10, 2014

**TO:**

Wareham Electronics, Inc.  
405 College Street  
Scotch Plains, NJ 07076

**SHIP TO:**

Wareham Electronics, Inc.  
405 College Street  
Scotch Plains, NJ 07076

**COMMENTS OR SPECIAL INSTRUCTIONS:**

SALESPERSON	REQUISITIONER	SHIPPED VIA	F.O.B. POINT	TERMS
Jasmine Bordere	Amanda Beck	Ground	Destination	2/10, N/30

QUANTITY	DESCRIPTION	UNIT PRICE	TOTAL
250	4Gen_7v. CPU	\$1,776.46	\$710,584.00
<p><b>Received By:</b></p> <p><i>Christine Johnson</i></p> <p>1/18/14</p>			
SUBTOTAL			\$710,584.00
SALES TAX			
SHIPPING & HANDLING			
TOTAL DUE			\$710,584.00

Make all checks payable to Masaharu Electronics  
Payments are due within 30 days.

Thank you for your business!

**American Metals**

1 American Metals Lane  
Tipton, IA 52722

**INVOICE**

INVOICE #58008  
DATE: FEBRUARY 4, 2014

**TO:**

Wareham Electronics, Inc.  
405 College Street  
Scotch Plains, NJ 07076

**SHIP TO:**

Wareham Electronics, Inc.  
405 College Street  
Scotch Plains, NJ 07076

**COMMENTS OR SPECIAL INSTRUCTIONS:**

SALESPERSON	REQUISITIONER	SHIPPED VIA	F.O.B. POINT	TERMS
Ryan Dunn	Amanda Beck	Ground	Destination	2/10, N/30

QUANTITY	DESCRIPTION	UNIT PRICE	TOTAL
2300lb.	Forged Titanium	\$351.22	\$807,814.00
<p><b>Received By:</b></p> <p><i>Christine Johnson</i></p> <p>2/17/14</p>			
SUBTOTAL			\$807,814.00
SALES TAX			
SHIPPING & HANDLING			
TOTAL DUE			\$807,814.00

Make all checks payable to American Metals  
Payments are due within 30 days.

Thank you for your business!

**Resin Resources**

Hwy 1 & Riley Ranch Road  
Carmen, CA 94121

**INVOICE**

INVOICE #64322  
DATE: FEBRUARY 2, 2014

**TO:**

Wareham Electronics, Inc.  
405 College Street  
Scotch Plains, NJ 07076

**SHIP TO:**

Wareham Electronics, Inc.  
405 College Street  
Scotch Plains, NJ 07076

**COMMENTS OR SPECIAL INSTRUCTIONS:**

SALESPERSON	REQUISITIONER	SHIPPED VIA	F.O.B. POINT	TERMS
Jackson Lamar	Amanda Beck	Ground	Destination	2/10, N/30

QUANTITY	DESCRIPTION	UNIT PRICE	TOTAL
5000yd.	Polypropylene	\$14.00	\$70,000.00
2100yd.	Wound Nylon	\$86.00	\$180,600.00
2,300	Tense Nylon	\$221.00	\$508,300.00
145lb	Copper	\$108.00	\$15,660.00
<b>Received By:</b> <i>Christine Johnson</i> 2/23/14			
SUBTOTAL			\$774,560.00
SALES TAX			
SHIPPING & HANDLING			
TOTAL DUE			\$774,560.00

Make all checks payable to Resin Resources  
Payments are due within 30 days.

Thank you for your business!

**Small Parts Electronics, Inc.**

610 Oaks Drive  
Birmingham, AL 35209

**INVOICE**

INVOICE #35229  
DATE: FEBRUARY 10, 2014

**TO:**

Wareham Electronics, Inc.  
405 College Street  
Scotch Plains, NJ 07076

**SHIP TO:**

Wareham Electronics, Inc.  
405 College Street  
Scotch Plains, NJ 07076

**COMMENTS OR SPECIAL INSTRUCTIONS:**

SALESPERSON	REQUISITIONER	SHIPPED VIA	F.O.B. POINT	TERMS
Kim Campbell	Amanda Beck	Ground	Destination	2/10, N/30

QUANTITY	DESCRIPTION	UNIT PRICE	TOTAL
15,000	#133 Regulator	\$6.98	\$104,700.00
35,000	Small end cap	\$1.35	\$47,250.00
12,250	Chrome grate #87XC43	\$23.65	\$289,712.50
<b>Received By:</b>			
<i>Christine Johnson</i>			
<i>2/24/14</i>			
SUBTOTAL			\$441,662.50
SALES TAX			
SHIPPING & HANDLING			
TOTAL DUE			\$441,662.50

Make all checks payable to Small Parts Electronics, Inc.  
Payments are due within 30 days.

Thank you for your business!



**Templateberry**

110 Commerce Drive  
San Francisco, CA 94109

**INVOICE**

INVOICE #17700  
DATE: JANUARY 22, 2014

**TO:**

Wareham Electronics, Inc.  
405 College Street  
Scotch Plains, NJ 07076

**SHIP TO:**

Wareham Electronics, Inc.  
405 College Street  
Scotch Plains, NJ 07076

**COMMENTS OR SPECIAL INSTRUCTIONS:**

SALESPERSON	REQUISITIONER	SHIPPED VIA	F.O.B. POINT	TERMS
William Berry	Amanda Beck	Ground	Destination	2/10, N/30

QUANTITY	DESCRIPTION	UNIT PRICE	TOTAL
1	Mock-up for project AZX-600	\$81,507.00	\$81,507.00
<p><b>Received By:</b></p> <p><i>Christine Johnson</i></p> <p><i>1/26/14</i></p>			
SUBTOTAL			\$81,507.00
SALES TAX			
SHIPPING & HANDLING			
TOTAL DUE			\$81,507.00

Make all checks payable to Templateberry  
Payments are due within 30 days.

Thank you for your business!

The source documents necessary to complete Task 1 will be provided to you at a later time. You should consider this delay in the delivery of source documents similarly to how client contacts sometimes only provide a portion of the source documents you request, and then complete the request at a later time.

In the meantime, please place all of the source documents back in to **Envelope 1** and then turn to page 6 of the Auditor Booklet which provides instructions for Task 2.

## ENVELOPE 2

LD CORP. 2109 COLLEGE STREET CHICAGO, IL 60007	37194
	DATE <u>May 3, 2013</u>
PAY TO THE ORDER OF <u>BENNETT BROTHERS IT SOLUTIONS</u>	\$ <u>34,901.00</u>
<u>THIRTY FOUR THOUSAND NINE HUNDRED AND ONE</u> DOLLARS	
FIRST RIGHTS BANK 1525 2 <sup>ND</sup> AVENUE NEW YORK, NY 10005 (212) 876-8916	
FOR <u>IT SERVICES</u>	<u>A. Stepanik</u> <u>A. Wright</u>
⑆ 071004022 ⑆ ⑈ 22 0987 6143 ⑈	37194

LD CORP. 2109 COLLEGE STREET CHICAGO, IL 60007	37196
	DATE <u>May 3, 2013</u>
PAY TO THE ORDER OF <u>SUPPLY STORE, INC.</u>	\$ <u>17,616.00</u>
<u>SEVENTEEN THOUSAND SIX HUNDRED AND SIXTEEN</u> DOLLARS	
FIRST RIGHTS BANK 1525 2 <sup>ND</sup> AVENUE NEW YORK, NY 10005 (212) 876-8916	
FOR <u>SUPPLIES</u>	<u>A. Stepanik</u> <u>A. Wright</u>
⑆ 071004022 ⑆ ⑈ 22 0987 6143 ⑈	37196

LD CORP. 2109 COLLEGE STREET CHICAGO, IL 60007	37211
	DATE <u>May 13, 2013</u>
PAY TO THE ORDER OF <u>MIDWEST POWER</u>	\$ <u>24,321.00</u>
<u>TWENTY FOUR THOUSAND THREE HUNDRED AND TWENTY ONE</u> DOLLARS	
FIRST RIGHTS BANK 1525 2 <sup>ND</sup> AVENUE NEW YORK, NY 10005 (212) 876-8916	
FOR <u>ELECTRIC BILL</u>	<u>A. Stepanik</u> <u>A. Wright</u>
⑆ 071004022 ⑆ ⑈ 22 0987 6143 ⑈	37211

LD CORP. 2109 COLLEGE STREET CHICAGO, IL 60007	37258
	DATE <u>May 16, 2013</u>
PAY TO THE ORDER OF <u>US INSURANCE</u>	\$ <u>17,708.00</u>
<u>SEVENTEEN THOUSAND SEVEN HUNDRED AND EIGHT</u>	<u>DOLLARS</u>
FIRST RIGHTS BANK 1525 2 <sup>ND</sup> AVENUE NEW YORK, NY 10005 (212) 876-8916	<u><i>A. Stojanich</i></u> <u>A. Wright</u>
FOR <u>ANNUAL INSURANCE PREMIUM</u>	
⑆071004022⑆ ⑈22 0987 6143 ⑈	37258

LD CORP. 2109 COLLEGE STREET CHICAGO, IL 60007	37270
	DATE <u>May 21, 2013</u>
PAY TO THE ORDER OF <u>THORNTON LAB EQUIPMENT</u>	\$ <u>45,461.00</u>
<u>FORTY FIVE THOUSAND FOUR HUNDRED AND SIXTY ONE</u>	<u>DOLLARS</u>
FIRST RIGHTS BANK 1525 2 <sup>ND</sup> AVENUE NEW YORK, NY 10005 (212) 876-8916	<u><i>J. Smith</i></u> <u>A. Wright</u>
FOR <u>EQUIPMENT</u>	
⑆071004022⑆ ⑈22 0987 6143 ⑈	37270

LD CORP. 2109 COLLEGE STREET CHICAGO, IL 60007	37294
	DATE <u>May 24, 2013</u>
PAY TO THE ORDER OF <u>SCRIPS INC</u>	\$ <u>16,127.00</u>
<u>SIXTEEN THOUSAND ONE HUNDRED AND TWENTY SEVEN</u>	<u>DOLLARS</u>
FIRST RIGHTS BANK 1525 2 <sup>ND</sup> AVENUE NEW YORK, NY 10005 (212) 876-8916	<u><i>J. Smith</i></u> <u>A. Wright</u>
FOR <u>INVENTORY</u>	
⑆071004022⑆ ⑈22 0987 6143 ⑈	37294

LD CORP. 37296  
2109 COLLEGE STREET  
CHICAGO, IL 60007  
DATE May 24, 2013  
PAY TO THE ORDER OF PENCHOFF REPAIR \$ 11,048.00  
ELEVEN THOUSAND AND FORTY EIGHT DOLLARS  
FIRST RIGHTS BANK  
1525 2<sup>ND</sup> AVENUE NEW YORK, NY 10005  
(212) 876-8916  
FOR BLDG MAINT  
J. Smith  
A. Wright  
37296  
⑆071004022⑆ ⑆22 0987 6143 ⑆

LD CORP. 37313  
2109 COLLEGE STREET  
CHICAGO, IL 60007  
DATE May 27, 2013  
PAY TO THE ORDER OF MEDS + PLUS \$ 47,014.00  
FORTY SEVEN THOUSAND AND FOURTEEN DOLLARS  
FIRST RIGHTS BANK  
1525 2<sup>ND</sup> AVENUE NEW YORK, NY 10005  
(212) 876-8916  
FOR INVENTORY  
A. Stojanick  
37313  
⑆071004022⑆ ⑆22 0987 6143 ⑆

The source documents necessary to complete Task 2 will be provided to you at a later time. You should consider this delay in the delivery of source documents similarly to how client contacts sometimes only provide a portion of the source documents you request, and then complete the request at a later time.

In the meantime, please place all of the source documents back in to **Envelope 2** and then go ahead and open **Envelope 3**, which includes the remainder of the source documents necessary to complete Task 1, a search for unrecorded liabilities. You will also need open the Auditor Booklet to page 4 in order to document the conclusion of your testing of Task 1.

## ENVELOPE 3



**Fireside Logistics**

28 Quail Hollow  
 Fireside, CA 94365

**INVOICE**

INVOICE #4169  
 DATE: FEBRUARY 15, 2014

**TO:**

Wareham Electronics, Inc.  
 405 College Street  
 Scotch Plains, NJ 07076

**SHIP TO:**

Wareham Electronics, Inc.  
 405 College Street  
 Scotch Plains, NJ 07076

**COMMENTS OR SPECIAL INSTRUCTIONS:**

SALESPERSON	REQUISITIONER	SHIPPED VIA	F.O.B. POINT	TERMS
Kathy Black	Amanda Beck	Ground	Destination	2/10, N/30

QUANTITY	DESCRIPTION	UNIT PRICE	TOTAL
1	Infinite-use license for Fireside XII	\$324,523.00	\$324,523.00
<p><b>Received By:</b></p> <p><i>Christine Johnson</i></p> <p>2/21/14</p>			
		SUBTOTAL	\$324,523.00
		SALES TAX	
		SHIPPING & HANDLING	
		TOTAL DUE	\$324,523.00

Make all checks payable to Fireside Logistics  
 Payments are due within 30 days.

Thank you for your business!

**Masahuro Electronics**

128 Commerce Blvd.  
Monterey, CA 93940

**INVOICE**

INVOICE #13698  
DATE: DECEMBER 17, 2013

**TO:**

Wareham Electronics, Inc.  
405 College Street  
Scotch Plains, NJ 07076

**SHIP TO:**

Wareham Electronics, Inc.  
405 College Street  
Scotch Plains, NJ 07076

**COMMENTS OR SPECIAL INSTRUCTIONS:**

SALESPERSON	REQUISITIONER	SHIPPED VIA	F.O.B. POINT	TERMS
Jasmine Bordere	Amanda Beck	Ground	Destination	2/10, N/30

QUANTITY	DESCRIPTION	UNIT PRICE	TOTAL
250	4Gen_6v. CPU	\$1,665.22	\$416,305.00
<p><b>Received By:</b></p> <p><i>Christine Johnson</i></p> <p>12/22/13</p>			
SUBTOTAL			\$416,305.00
SALES TAX			
SHIPPING & HANDLING			
TOTAL DUE			\$416,305.00

Make all checks payable to Masahuro Electronics  
Payments are due within 30 days.

Thank you for your business!

You now have all of the information necessary to complete Task 1. Once you have completed your testwork, please place the source documents back in **Envelope 3**, and then go ahead and open **Envelope 4**, which includes the remainder of the source documents necessary to complete Task 2, internal control testwork. You will also need open the Auditor Booklet to page 8 in order to document the conclusion of your testing of Task 2.

**Please record the current time \_\_\_\_\_**

## ENVELOPE 4

LD CORP. 2109 COLLEGE STREET CHICAGO, IL 60007	37344
	DATE <u>June 2, 2013</u>
PAY TO THE ORDER OF <u>COLLINS CORP</u>	\$ <u>29,273.00</u>
<u>TWENTY NINE THOUSAND TWO HNDRED AND SEVENTY THREE</u> DOLLARS	
FIRST RIGHTS BANK 1525 2 <sup>ND</sup> AVENUE NEW YORK, NY 10005 (212) 876-8916	<u>J. Smith</u> <u>A. Wright</u>
FOR <u>INVENTORY</u>	
⑆ 071004022 ⑆ ⑈ 22 0987 6143 ⑈	37344

LD CORP. 2109 COLLEGE STREET CHICAGO, IL 60007	37352
	DATE <u>June 7, 2013</u>
PAY TO THE ORDER OF <u>CLEAN PROS</u>	\$ <u>46,063.00</u>
<u>FORTY SIX THOUSAND AND SIXTY THREE</u> DOLLARS	
FIRST RIGHTS BANK 1525 2 <sup>ND</sup> AVENUE NEW YORK, NY 10005 (212) 876-8916	<u>J. Smith</u> <u>A. Wright</u>
FOR <u>ANNUAL CLEANING</u>	
⑆ 071004022 ⑆ ⑈ 22 0987 6143 ⑈	37352

The source documents necessary to complete Task 2 will be provided to you at a later time. You should consider this delay in the delivery of source documents similarly to how client contacts sometimes only provide a portion of the source documents you request, and then complete the request at a later time.

In the meantime, please place all of the source documents back in to **Envelope 4** and then turn to page 9 of the Auditor Booklet which provides instructions for the Final Task.

## ENVELOPE 5

## Partial Audit Program for Accounts Receivable and Allowance for Doubtful Accounts

### Audit Objectives:

1. Accounts receivable are authentic obligations owed to the company at the balance sheet date.
2. Accounts receivable include all amounts owed to the company at the balance sheet date.
3. The allowance for doubtful accounts is adequate but not excessive.
4. Revenues are recorded appropriately on accrual basis and properly classified.

Audit Procedure	Sign-off	W/P Ref
<b>1. Obtain an aged trial balance of accounts receivable.</b>		
a. Test the clerical accuracy.	MP	C.02
b. Reconcile the balance to the general ledger.	MP	C.02
c. Determine that the following accounts are identified for specific classification in the balance sheet: Large credit balances; Related party receivables; Employee receivables; Noncurrent receivables	MP	C.02, C.05
<b>2. Perform necessary confirmation procedures:</b>		
a. For account balances to be tested at 100% (i.e., Individually Significant Items), perform confirmation procedures.	MP	C.03
b. Determine if a sample of the accounts making up the remaining balance should be selected for confirmation. Document the sampling selection.	MP	C.01, C.03
c. For all confirmations, control the mailing of the letters and be sure that the confirmations are to be returned directly to the auditor and contain a return envelope for this purpose.	MP	C.01, C.03
<b>3. Process the confirmation replies:</b>		
a. Reconcile differences reported by customers on confirmation replies.	MP	C.03
b. Perform alternative procedures for those customers that do not respond.	N/A	
c. For groups confirmed 100%, summarize the results of confirmation procedures and indicate the total accounts and balances confirmed without exception, confirmations reconciled, non-replies with alternative procedures performed, and confirmations and non-replies with misstatements.	MP	C.03
d. For accounts receivable groups that were sampled, summarize and evaluate the sample results and project the misstatements in the strata.	MP	C.03
e. Based on results of confirmation procedures, determine if additional confirmation or alternative procedures are warranted on untested customer balances.	MP	C.03
f. Summarize any misstatements identified and conclude on whether an adjustment to the accounts receivable balance is necessary.	MP	C.03
<b>4. Test the adequacy of the allowance for doubtful accounts</b>		
a. Analyze the client's allowance calculation and conclude on its reasonableness.	MP	C.04
b. Perform a roll-forward of the allowance account.	MP	C.04
c. Perform a hindsight analysis of the allowance for doubtful accounts.	MP	C.04
d. Review write-offs during the year for unusual transactions or trends.	MP	C.04a



WP: C  
Accounts Receivable Lead Sheet  
FYE: 12/31/13

Prepared by: MP

<u>Account No.</u>	<u>Account Name</u>	<u>12/31/2013 Balance</u>	<u>12/31/2012 Balance</u>
1300-00	Trade Accounts Receivable	35,660,000 C.02	32,650,000 PY
1300-10	Allowance for Doubtful Accounts	(6,460,000) C.04	(6,480,000) PY
1310-00	Related Party Receivable	3,100,000 C.07	2,000,000 PY
1320-00	Other Receivables	5,900,000 C.08	6,000,000 PY
	<b>Group Total</b>	<b><u>38,200,000</u></b>	<b><u>34,170,000</u></b>

WP: C.01

Prepared by: MP

FYE: 12/31/13

### Summary of Audit Work Performed Re: A/R and ADA

**Purpose:**

To document client methodologies and audit procedures performed related to accounts receivable and the allowance for doubtful accounts of Wareham Electronics, Inc.

**Accounts Receivable:**

Trade accounts receivables represent amounts owed to Wareham Electronics, Inc. from various third-party customers, and are recorded at net realizable value.

**Tests:**

I began by obtaining an Aged AR detail (C.02) which ties to the AR Lead Sheet (C). I footed the detail w/o/e. All subtotals and percentages are accurate and reasonable.

I performed confirmation procedures in order to assess the Existence of accounts receivable. First, I confirmed 100% of accounts receivables greater than \$1,000,000 (this scope was designated as Individually Significant during the planning meeting, per Audit Partner). Next, I chose a sample size of 8 customers (based on standard firm methodologies) for additional confirmation testing. Accordingly, I selected 8 customer accounts from the remaining population of customer accounts for testing. The results of testing are located at workpaper C.03. All firm-standard methodologies were followed in order to ensure proper control of the confirmations. Based on procedures performed, Accounts Receivable appears appropriately states at December 31, 2013.

**Allowance for Doubtful Accounts:**

Wareham calculates the Allowance for Doubtful Accounts by applying historical percentages of bad debts based on Aging categories. Accounts less than 31 days old are allowed for at 12.6%; Accounts less than 120 but older than 30 days are allowed for at 32.4%; accounts less than 365 but older than 120 days are allowed for at 65.2%; accounts older than 365 days are allowed for at 85.0%. Percentages applied are SALY (see C.04).

I recalculated and analyzed Wareham's Allowance calculation at C.04, noting no issues. C.04 also includes an Allowance roll forward which ties to the lead sheet w/o/m/e. Additionally, I performed a hindsight analysis at C.04. Based on the hindsight analysis, it appears that Wareham's historical procedures are adequate. Finally, I compared Aging bucket percentages to prior year at C.01, noting that the percentages are comparable. As a result of the procedures, I conclude that the Allowance for Doubtful Accounts appears reasonable.

**Conclusion:**

Accounts Receivable and Allowance for Doubtful Accounts are reasonable.

WP: C.02

NOTE: Prepared by client

FYE: 12/31/13

Wareham Electronics, Inc.  
Aged Accounts Receivable Detail

Cust No.	Customer Name	Total	<31 days	31-120 days	121-365 days	> 365 days
1001	Morrison & Son, Inc.	212,056	132,056	80,000	-	-
1030	All's Fair Appliance Co.	70,696	-	-	-	70,696
1037	Willis & Adams	739,335	100,120	639,215	-	-
1133	Putnam and Jacobs	732,753	490,000	242,753	-	-
1235	Aarhus Industries	136,706	136,706	-	-	-
1283	The Matthews Corp.	3,528,094	2,819,500	571,500	88,894	48,200
1300	Washington Mfg., Inc.	60,499	60,499	-	-	-
1307	Connect Plus	270,082	270,082	-	-	-
1340	Defense Industries, Inc.	6,920,000	5,200,000	1,720,000	-	-
1398	Mincin-Raleigh	97,852	97,852	-	-	-
1442	Coltrane Co.	135,260	85,260	-	50,000	-
1444	Zorocan Co.	290,577	290,577	-	-	-
1468	Acton Labs	4,360,575	3,500,275	-	860,300	-
1480	Mincin-Greensboro	26,178	26,178	-	-	-
1516	Kyle Peel	88,714	8,594	-	80,120	-
1532	Best Products	67,531	67,531	-	-	-
1595	Anderson Clothes, Inc.	544,358	544,358	-	-	-
1629	Sorenson's	393,165	-	-	-	393,165
1744	Ruch and Taylor	829,770	601,500	218,725	9,545	-
1771	EarthWear Online	1,235	-	-	-	1,235
1773	Natherson-Taylor	793,797	700,000	12,265	68,012	13,520
1777	Recycle U	793,671	790,651	-	3,020	-
1833	Ferrick Corp.	356,730	-	356,730	-	-
1853	Abbott Construction	239,121	-	239,121	-	-
1865	Giordani Corp.	300,112	18,524	21,478	260,110	-
1886	Wright Industries	682,310	682,310	-	-	-
1949	James Service Co.	17,504	12,850	2,604	1,350	700
1967	Friendly Furniture Inc.	781,286	271,048	-	510,238	-
1970	Zantee Bros.	97,558	-	-	-	97,558
2020	Calabro Wireless Services	7,807	-	7,807	-	-
2042	Kida Co.	800,004	562,349	-	200,004	37,651
2058	Mincin-Tupelo	3,924	3,924	-	-	-
2086	Dave's Discount Stores	76,866	-	-	-	76,866
2090	AA Stanley	651,391	-	-	298,902	352,489
2099	Moonbeam Corp.	949,428	859,792	76,253	-	13,383
2172	Dunn Industries, Inc.	295,137	295,137	-	-	-
2229	BCRR Corp.	358,910	300,000	-	-	58,910
2261	Strang Corp.	8,920	-	8,920	-	-
2268	Bright Star, Inc.	611,622	511,022	-	100,600	-
2362	Thomson Telecom	5,878,922	2,966,754	1,842,168	1,030,000	40,000
2365	Great Big Supplier	911,708	228,512	651,296	31,900	-
2379	Lenco, Inc.	8,250	8,250	-	-	-
2474	DeLaul Electronics	613,171	585,000	28,171	-	-
2489	Arastart Co.	916,616	417,639	482,361	16,616	-
<b>Total</b>		<b>35,660,201</b>	<b>23,644,850</b>	<b>7,201,367</b>	<b>3,609,611</b>	<b>1,204,373</b>
		<b>F</b>	<b>F</b>	<b>F</b>	<b>F</b>	<b>F</b>
		<b>C 35,660,000</b>	<b>66.31%</b>	<b>20.19%</b>	<b>10.12%</b>	<b>3.38%</b>
		<b>(201) imm</b>	<b>RC</b>	<b>RC</b>	<b>RC</b>	<b>RC</b>
	<b>PY</b>	<b>32,650,000</b>	<b>23,540,650</b>	<b>7,623,775</b>	<b>1,204,785</b>	<b>280,790</b>

**Conclusion:** Detail ties to the general ledger w/o/e. No credit balances, related party receivables, or employee receivables were noted during review.

Tickmark legend

F - footed

RC - Recalculated w/o/e.

F - crossfooted

imm - immaterial

PY - ties to prior year, without exception

**Instructions:** Complete the worksheet below by reviewing the accounts receivable confirmations and other audit evidence. If you determine that any difference noted by the customer represents a misstatement, record the amount of difference in the "Amount of Misstatement" column. Finally, provide your conclusion for the audit task. Any differences noted when testing sampled items should be projected to the population (excluding ISIs) and then the projected difference should be added to any differences noted when testing ISIs in order to determine the Total Misstatement. Tolerable misstatement is \$1,500,000 and the expected misstatement is \$600,000. If the estimated misstatement exceeds the expected misstatement, further testing is warranted.

**Individually Significant Items**

Customer ID	Customer Name		A/R Balance per client's records		A/R Balance per Customer	Amount of Difference		Amount of Misstatement
1283	The Matthews Corp.	C.02	3,528,094	C.03a	3,528,094	-		-
1340	Defense Industries, Inc.	C.02	6,920,000	C.03a	5,200,000	1,720,000	\$	-
1468	Acton Labs	C.02	4,360,575	C.03a	4,360,575	-		-
2362	Thomson Telecom	C.02	5,878,922	C.03a	5,858,922	20,000	#	20,000
<b>Total Dollar Amount of ISI</b>			20,687,591		18,947,591	1,740,000		20,000
			F		F	F		F

**Sampled Items**

Customer ID	Customer Name		A/R Balance per client's records		A/R Balance per Customer	Amount of Difference		Amount of Misstatement
1030	All's Fair Appliance Co.	C.02	70,696	C.03a	70,696	-		-
1235	Aarhus Industries	C.02	136,706	C.03a	65,205	71,501	%	71,501
1444	Zorocan Co.	C.02	290,577	C.03a	290,577	-		-
1629	Sorenson's	C.02	393,165	C.03a	393,165	-		-
1853	Abbott Construction	C.02	239,121	C.03a	239,121	-		-
2058	Mincin-Tupelo	C.02	3,924	C.03a	3,924	-		-
2172	Dunn Industries, Inc.	C.02	295,137	C.03a	295,137	-		-
2379	Lenco, Inc.	C.02	8,250	C.03a	-	8,250	@	-
<b>Total Dollar Amount of Items in Sample</b>			1,437,576		1,357,825	79,751		71,501
			F		F	F		F

Misstatements in ISI population

20,000

Estimated Misstatements in Sampled Population

71,501

Total Estimated Misstatement

91,501 imm

F

**Conclusion:** Gross Trade Receivables appear reasonably stated as the Total Estimated Misstatement is less than the Expected Misstatement. No additional testing is deemed necessary. No adjustment is considered necessary

Tickmark legend

F - footed

imm - immaterial

S - Alton Simon, VP of Finance for Defense Industries, Inc. noted that he mailed a payment on December 29, 2013 in the amount of \$1,720,000. Donald Winters, Controller of Wareham noted that they received payment on January 2, 2014 and deposited it then. I traced payment to being received on January 2 and deposited on January 4. As such, this difference appears to be a legitimate timing difference and not a misstatement.

# - Thomson Telecom noted they returned an order on December 20, 2013 in the amount of \$20,000. Per receiving docs, I verified the return was received by Wareham on December 27. As such, this represents a misstatement.

% - Aarhus's CFO noted the difference is due to a credit memo on November 12, 2013 in the amount of \$71,501. I vouched the difference to a credit memo without exception. As such, the difference represents a misstatement.

@ - Lenco noted the order in question was not received until January 2. However, Wareham's Controller noted the order was shipped December 30, 2013. FOB shipping point. I examined the signed invoice and shipping documents, noting the order was FOB destination. As such, the misstatement does not represent a misstatement.

**PBC Allowance Calculation:**

**NOTE:** Wareham calculates the allowance for doubtful accounts by using historical rates of bad debts for each aging bucket. This schedule was prepared by the accounts receivable manager for purposes of adjusting ADA as of the end of 2013. Percentages used are SALY, and reasonable.

	<u>Total</u>	<u>&lt; 31 days</u>	<u>31-120 days</u>	<u>121-365 days</u>	<u>&gt; 365 days</u>
AR Balance	32,650,000 <del>F</del>	23,540,650 <del>S</del>	7,623,775 <del>S</del>	1,204,785 <del>S</del>	280,790 <del>S</del>
Allowance percentages		PY 12.6% PY	32.4% PY	65.2% PY	85.0% PY
Allowance	6,460,416 <del>F</del>	2,966,122 <del>RC</del>	2,470,103 <del>RC</del>	785,520 <del>RC</del>	238,672 <del>RC</del>
Allowance per GL	6,480,000 <del>C</del>				
<i>difference</i>	19,584 <del>imm</del>				

**Allowance for Doubtful Accounts Rollforward**

	<u>2013</u>	<u>2012</u>
Beginning balance	\$ 6,480,135	\$ 6,449,000
Provision for bad debts	4,480,601 <del>C.04a</del>	4,102,684 <del>C.04a</del>
Write-offs	(4,289,699) <del>C.04a</del>	(3,820,549) <del>C.04a</del>
Recoveries		(251,000)
Ending balance	\$ 6,671,037 <del>F</del>	\$ 6,480,135 <del>F</del>
Per Lead Sheet	\$ 6,460,000 <del>C</del>	\$ 6,480,000 <del>PY</del>
<i>difference</i>	\$ 211,037 <del>imm</del>	\$ 135 <del>imm</del>

**Hindsight Analysis**

Prior year allowance	\$ 6,480,000 <del>PY</del>
Less: writeoffs in 2013 related to 2012 and older	<u>\$ (3,723,458) <del>Tied without exception</del></u>
<b>Over(under) allowance</b>	<u>\$ 2,756,542 <del>%</del></u> <del>F</del>

Tickmark legend

- ~~F~~ - footed
- ~~imm~~ - immaterial
- ~~RC~~ - Recalculated w/o/e.
- ~~F~~ - crossfooted
- ~~S~~ - MP tied each of these aging bucket balances to the Aged AR Detail w/o/e.
- ~~PY~~ - ties to prior year, without exception
- ~~%~~ - Allowance is conservatively stated. Balance is reasonable.

WP: C.04a  
FYE: 12/31/13

**NOTE:** Prepared by client

Monthly Allowance Rollforward				
Month	Provision	Writeoff	Recovery	Balance
<b>Balance forward</b>				6,479,768
January	378,832	(298,370)	28,123	6,588,353
February	464,807	(170,530)	14,984	6,897,614
March	481,376	(127,490)	-	7,251,499
April	475,554	(450,192)	9,546	7,286,408
May	514,512	(153,484)	-	7,647,437
June	138,368	(264,883)	-	7,520,921
July	456,299	(292,939)	-	7,684,282
August	387,340	(239,724)	122,548	7,954,446
September	55,526	(61,050)	35,469	7,984,391
October	221,209	(338,736)	-	7,866,864
November	447,791	(262,407)	-	8,052,248
December	458,986	(2,051,107)	-	6,460,127
<b>Total</b>	<b>4,480,601</b>	<b>(4,710,912)</b>	<b>210,670</b>	
	<b>C.04a</b>	<b>C.04a</b>		
	<b>F</b>	<b>F</b>	<b>F</b>	

**Conclusion:** Procedures appear consistent with prior year. Above totals will be used in assessing the reasonableness of ADA at C.04

Tickmark legend

**F** - footed

**imm** - immaterial

**RC** - Recalculated w/o/e.

**ƒ** - crossfooted

**WP: C.05**

**Prepared by: MP**

**FYE: 12/31/13**

#### **Listing of Related Parties and Significant Employees**

**Note:** The following listing of related parties and significant employees was provided by management during planning. Procedures related to related parties are performed in the planning section of the audit files. This list is included in the AR section in order to ensure that no related party or employee receivables are included in Trade AR.

#### **Related Parties:**

Morgan Adams, LLC – Affiliated Company

The Acme Corporation – owned by immediate family member of CEO

Willis & Adams – subsidiary of a common parent corporation

#### **Significant Employees:**

Rich Key - CEO

Lisa Houston - CFO

Kyle Peel - VP

Donald Winters - Controller

Todd Parsons - AR Manager

Laverne Williams - AP Manager

**Conclusion:** I reviewed the AR aging for related party and/or employee receivables, noting none.

You now have all of the information necessary to complete audit task #3. Once you have completed your review of the audit workpapers, please place the staff workpapers back in **Envelope 5**, and then move on to the very brief questionnaire found on page 13 of the Auditor Booklet.

**Please record the current time \_\_\_\_\_**



APPENDIX B  
IRB CERTIFICATION

Office for Research  
Institutional Review Board for the  
Protection of Human Subjects

THE UNIVERSITY OF  
**ALABAMA**  
R E S E A R C H

July 2, 2014

Curtis Mullis  
Dept of Accounting  
CCBA  
Box 870220

Re: IRB#: 14-OR-258 "The Lingering Effects of Multi-tasking on Auditors' Self-Control Resources and Judgment Quality"

Dear Mr. Mullis:

The University of Alabama Institutional Review Board has granted approval for your proposed research.

Your application has been given expedited approval according to 45 CFR part 46. You have also been granted the requested waiver of written documentation of informed consent. Approval has been given under expedited review category 7 as outlined below:

(7) Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies

Your application will expire on July 1, 2015. If your research will continue beyond this date, complete the relevant portions of the IRB Renewal Application. If you wish to modify the application, complete the Modification of an Approved Protocol Form. Changes in this study cannot be initiated without IRB approval, except when necessary to eliminate apparent immediate hazards to participants. When the study closes, complete the appropriate portions of the IRB Request for Study Closure Form.

Please use reproductions of the IRB approved stamped information sheets to obtain consent from your participants.

Should you need to submit any further correspondence regarding this proposal, please include the above application number.

Good luck with your research.

Sincerely,



358 Rose Administration Building  
Box 870127  
Tuscaloosa, Alabama 35487-0127  
(205) 348-8461  
FAX (205) 348-7189  
TOLL FREE (877) 820-3066

Carpano T. Myles, MSM, CIM, CFP  
Director & Research Compliance Officer  
Office of Research Compliance  
The University of Alabama

IRB Project #: 14-OR-258

JUN 25 2014 PM 03:21

UNIVERSITY OF ALABAMA  
INSTITUTIONAL REVIEW BOARD FOR THE PROTECTION OF HUMAN SUBJECTS  
REQUEST FOR APPROVAL OF RESEARCH INVOLVING HUMAN SUBJECTS

I. Identifying information

	Principal Investigator	Second Investigator	Third Investigator
Names:	Curtis Mullis	Rick Hatfield	
Department:	Culverhouse College of Accountancy	Culverhouse College of Accountancy	
College:	Culverhouse College of Commerce & Business Administration	Culverhouse College of Commerce & Business Administration	
University:	University of Alabama	University of Alabama	
Address:	Box 870220	Box 870220	
Telephone:	205-348-8392	205-348-8392	
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E-mail:	cemullis@cba.ua.edu	rhatfiel@cba.ua.edu	

Title of Research Project: The Lingering Effects of Multi-tasking on Auditors' Self-Control Resources and Judgment Quality

Date Submitted: 6/24/14  
Funding Source: Culverhouse College of Commerce & Business Administration and Culverhouse School of Accountancy

Type of Proposal  New  Revision  Renewal  Completed  Exempt

Please attach a renewal application

Please attach a continuing review of studies form

Please enter the original IRB # at the top of the page

UA faculty or staff member signature: \_\_\_\_\_

II. NOTIFICATION OF IRB ACTION (to be completed by IRB):

Type of Review: \_\_\_\_\_ Full board  Expedited

IRB Action:

\_\_\_\_ Rejected Date: \_\_\_\_\_

\_\_\_\_ Tabled Pending Revisions Date: \_\_\_\_\_

Approved Pending Revisions Date: \_\_\_\_\_

Approved-this proposal complies with University and federal regulations for the protection of human subjects.

Approval is effective until the following date: 7/1/2015

Items approved:  Research protocol (dated \_\_\_\_\_)

\_\_\_\_ Informed consent (dated \_\_\_\_\_)

\_\_\_\_ Recruitment materials (dated \_\_\_\_\_)

Other waiver, info sheet (dated \_\_\_\_\_)

Approval signature

### Research Invitation

You are being asked to participate in a research study. Curtis Mullis, Principal Investigator from The University of Alabama, is interested in further understanding auditor testing and auditor review decisions. This case will simulate some typical audit tasks. You will be provided with hypothetical audit scenarios and asked to make decisions and conclusions regarding testwork. Please be assured that all responses will be held in **strict confidence**. Participation is voluntary. You are free not to participate or to quit the study prior to completion. Only the investigators will have access to the data, no data will include any identifying information, and no attempt will be made to attribute responses to individuals. Only summarized data will be presented at meetings or in publication. The study should take you around 45 total minutes to complete.

By completing the research case, and providing your responses, you freely provide consent and acknowledge your rights as a voluntary participant. The findings from this study will contribute to a better understanding of the auditing environment and will be useful to the accounting research community. There are no direct risks to you related to completing this study.

Please assume that you are an audit senior assigned to the 2013 audit engagement for Wareham Electronics, Inc.

When completing the case, please keep in mind that there are no correct answers other than your honest perceptions about the information provided. Please also be aware that the case is not intended to include all of the information that would be available if you were in a real-world situation. Therefore, for purposes of this study, base your judgments only on the information provided.

If you have questions about the research study, please contact the principal investigator, Curtis Mullis at (205) 348-0150, or his faculty advisor Rick Hatfield at (205) 348-2901.

If you understand the statements above, are at least 19 years old, and freely consent to be in this study, please proceed with the research case.

Thank you very much for your consideration.

Sincerely,

Curtis Mullis, CPA

If you have questions about your rights as a person taking part in a research study, make suggestions or file complaints and concerns, you may call Ms. Tanta Myles, the Research Compliance Officer of the University at (205)-348-8461 or toll-free at 1-877-820-3066. You may also ask questions, make suggestions, or file complaints and concerns through the IRB Outreach Website at [http://osp.ua.edu/site/PRCO\\_Welcome.html](http://osp.ua.edu/site/PRCO_Welcome.html). You may direct emails to [participantoutreach@bama.ua.edu](mailto:participantoutreach@bama.ua.edu)

UA IRB Approved Document  
Approval date: 7/2/14  
Expiration date: 7/1/2015