

The Effect of Risk of Misstatement and Workload Pressure on the Choice of Workpaper Review Format

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November 2007

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We would like to thank Tamara Lambert, Scott Vandervelde, and workshop participants at the 2007 International Symposium on Audit Research. We appreciate the support of the audit professionals who participated in this study.

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ABSTRACT: The advent of electronic communication and electronic workpapers at audit firms has provided workpaper reviewers with options of how to interact with their audit team. Concurrently, other review formats have developed that rely more on in-person communication (e.g., review-by-interview). Prior research indicates that in-person discussion during review results in qualitatively different workpapers and judgments than when the reviewer interacts with the workpaper preparer electronically. As reviewers typically have discretion over how to conduct their reviews, the choice of review format can be viewed as a controllable audit input. Thus, the reviewer's choice of review format could impact the quality of the audit review team's work. Our study extends the audit review process literature by examining reviewers' choice of the form of their reviews and by considering factors that influence that choice. Specifically, we examine the effect of misstatement risk and workload pressure on this choice. We find that misstatement risk and workload pressure affect reviewers' review mode choices, with both those facing low risk and those under high pressure more likely to perform their reviews electronically. Further, risk and workload pressure interact to affect reviewers' likelihood of choosing to review electronically. Results indicate that misstatement risk moderates the effect of workload pressure such that, when risk is high, the effect of workload pressure is reduced. Our findings provide insight to firms and regulators regarding the impact of misstatement risk and workload pressure on how audit workpaper reviewers conduct their reviews. These issues are particularly relevant in light of recent changes in the regulatory environment that both emphasize the auditor's role in detecting fraud/misstatements and exacerbate traditional workload pressures during busy times of the year.

Keywords: *review process; electronic communication; face-to-face interaction; workload pressure; workload compression; misstatement risk*

Data Availability: *Data are available upon request.*

I. INTRODUCTION

This study examines how risk of misstatement and workload pressure affect audit workpaper reviewers' choice of review format. The audit review process requires considerable audit firm resources, as more than 50 percent of audit manager time and 30 percent of total audit hours are typically allocated to review (Bamber and Bylinski 1987; Asare and McDaniel 1996). Further, recent regulatory changes have resulted in increased auditor workloads (Sarbanes-Oxley Act of 2002 (SOX); PCAOB 2004; SEC 2005). The advent of electronic communication and electronic workpapers has provided auditors with the means to alleviate certain pressures on firm resources. Electronically reviewing workpapers and transmitting review notes can ease scheduling issues and reduce reviewer travel time as it permits reviewers to review multiple jobs concurrently and from a remote location. However, other review methods have also evolved that rely more on personal interaction between audit team members (e.g., review-by-interview, real-time review (Wilks 2002; Payne et al. 2006)), as greater face-to-face communication has the potential to improve workpaper quality (Agoglia et al. 2006; Payne et al. 2006). This evolution of alternative modes in which to conduct reviews has been acknowledged by the International Federation of Accountants (IFA), which advises that explicit consideration should be given to the review format choice during the audit planning process and has revised its standards accordingly (IFA 2004). The importance of this choice is further highlighted by recent research which suggests that the effectiveness of the review process, as well as the quality of audit judgments and supporting workpaper documentation, is influenced by review format (Brazel et al. 2004; Payne et al. 2006; Agoglia et al. 2006).

As reviewers utilize different methods of review, they are likely to form perceptions regarding these review options. This, in turn, may affect their decision of how to conduct their

reviews. The literature suggests that an individual's choice of communication medium is, in part, dependent on the perceived advantages and disadvantages of the medium (relative to others), given the characteristics of the particular task at hand (Webster and Trevino 1995). Audit guidance prescribes and prior research indicates that risk is a characteristic that can affect auditor judgments (e.g., AICPA 1983; Biggs et al. 1988; Bell et al. 1994; Davidson and Gist 1996; Mock and Wright 1999; Mueller and Anderson 2002). While prior research does not examine the review mode decision, it is possible that reviewers will weigh the relative advantages/disadvantages of electronic and face-to-face interaction during review differently depending on the level of risk associated with the audit task. In addition, review mode choices may be sensitive to the intensity of reviewers' workloads, particularly in the post-SOX environment in which workloads can, at times, be quite compressed. Given the efficiency gains possible with electronic review, reviewers may consider this relative advantage to be more crucial when facing such pressures than when workload pressures are lower. We extend the literature by examining reviewers' choice of review format and the effect of risk of misstatement and workload pressure on that choice.

We conduct both a survey and an experiment to investigate the review mode decision. We first examine reviewer perceptions regarding the relative advantages of face-to-face and electronic review modes through a survey of practicing audit partners and managers. Our survey results indicate that reviewers view in-person interaction during review as more effective and electronic interaction as more convenient. Further, reviewers report that they use, on average, electronic and in-person communication for roughly an equal proportion of their review interactions.

Given our survey findings regarding perceptions of the relative advantages of in-person and electronic interaction during review, we conduct an experiment to examine whether certain task characteristics influence reviewers' choice of review mode. We present auditors with an experimental case involving the review of workpapers relating to substantive testing of the sales and collection cycle. We manipulate, between participants, the risk of misstatement as high or low and reviewers' current workload pressure (i.e., pressure relating to the amount of other work/engagements on which the auditor is currently working) as high or low. After examining the case materials, the auditors were asked to indicate how they planned to conduct their reviews, either in-person or electronically.

Our results indicate that risk of misstatement and workload pressure significantly affect participants' review mode choices. Specifically, reviewers facing a high risk of misstatement are more likely to choose to interact in person during review than reviewers facing a low risk of misstatement. Further, reviewers with hectic work schedules are more likely to communicate electronically with their workpaper preparers than reviewers with low workload pressures. These findings suggest that reviewers perceive reviews involving face-to-face communication to be more appropriate when effectiveness of procedures is essential and consider electronic interaction to be a practicable way to cope with the increasing stress of workload pressure. We also find a significant interaction between risk of misstatement and workload pressure. Specifically, misstatement risk moderates the effect of workload pressure such that, when risk is high, the effect of workload pressure is reduced. In addition to our findings regarding the *nature* of the review, we also find that the risk of misstatement, but not workload pressure, affects the *extent* of planned audit work (i.e., budgeted hours for both substantive testing and review).

This study contributes to the review process literature by examining reviewers' *choice* of review format. This choice is important to investigate given its potential qualitative implications for the audit (Brazel et al. 2004; Agoglia et al. 2006). While prior research on the review process has concentrated on the effects of accountability (e.g., Johnson and Kaplan 1991; Kennedy 1993; Koonce et al. 1995; Tan and Kao 1999) or the effects of the review process as an independent variable (Brazel et al. 2004; Payne 2004; Agoglia et al. 2006; Payne et al. 2006), our study is the first to consider factors that may influence how reviewers choose to conduct their reviews (i.e., review format as a dependent variable). The factors we consider (misstatement risk and workload pressure) are particularly relevant given recent changes to the regulatory environment (e.g., compliance with Section 404 of SOX and Statement on Auditing Standards No. 99) that emphasize the auditor's role in detecting fraud/misstatements and exacerbate traditional workload pressures during busy season (McGee 2005; Gullapalli 2005).

The remainder of this paper is organized as follows. The next section discusses the background and related research and develops hypotheses. This is followed by a discussion of the method and presentation of the results. The final section offers conclusions and implications.

II. BACKGROUND AND HYPOTHESIS DEVELOPMENT

Alternative Modes of Review

While conducting financial statement audits, staff auditors generate workpapers describing the work performed, methods used, and conclusions drawn which are subject to review by a supervising auditor (Emby and Gibbins 1988; Agoglia et al. 2003). The review process helps ensure the adequateness of procedures performed and appropriateness of conclusions drawn (AICPA 1978). Given the significant resources devoted to review, firms have made an effort to streamline this process (Rich et al. 1997). Technological advancements made

in recent years (e.g., electronic workpapers and electronic communication) have provided reviewers with options regarding how they wish to conduct their reviews. With the switch to electronic workpapers and e-mail, electronic review has become a mainstay for workpaper reviewers (Brazel et al. 2004).¹ These electronic reviews typically involve the reviewer examining workpapers online and interacting with the preparer electronically to relay, discuss, and resolve review notes.

Concurrently, other review methods have evolved that rely more heavily on in-person interaction during review, such as review-by-interview and real-time review. Review-by-interview involves the reviewer questioning the preparer about procedures performed, evidence gathered, and the basis for workpaper conclusions (Payne 2004). A similar approach referred to as real-time review involves more frequent reviewer-preparer interaction, including discussions prior to the preparer performing audit procedures (Wilks 2002). The IFA has acknowledged the increased use of alternative forms of review and, consequently, has advised that an integral part of audit planning is determining whether manager and partner reviews should occur at the client, off-site, or both (IFA 2004).

Relative Advantages of Electronic and Face-to-Face Communication

Electronic communication and face-to-face communication offer different relative advantages. Face-to-face communication allows for synchronous interaction (and, in turn, the possibility of rich and detailed exchanges) between the relevant parties and can convey paraverbal and nonverbal aspects of communication such as facial expressions, body language, expressions of feelings and emotions, stuttering, and hesitated responses (Baltes et al. 2002; Brazel et al. 2004; Kock 2005). These sorts of paraverbal and nonverbal cues help to more fully

¹ Additionally, we conduct a survey of 23 audit partners and managers which indicates that, on average, reviewers use electronic review about half of the time (48.9%).

convey the communicator's message (Daft et al. 1987; Nöteberg et al. 2003). From the time we are children our brains are programmed to expect these elements, making face-to-face a more natural medium of communication (Kock 2005). However, electronic communication is less bound by time and physical location, making collaboration between dispersed individuals more convenient (e.g., relieving certain logistical challenges such as arranging meeting times and locations) and less expensive than traveling to meet face-to-face (Baltes et al. 2002; Murthy and Kerr 2004; Kock 2005). Similarly, in an audit context, electronic communication offers two key advantages to the reviewer: a) it allows for the review of multiple jobs concurrently and b) it reduces the time spent traveling between clients and the necessity to coordinate schedules with preparers (Shumate and Brooks 2001).

While these conveniences have helped make electronic communication (and electronic review) ubiquitous, there are questions as to whether its tradeoffs (e.g., rich, synchronous exchanges for greater convenience) result in decisions of similar quality to face-to-face interaction (e.g., Baltes et al. 2002). Recent research suggests that staff auditors prepare more effective workpapers and make higher quality judgments when expecting a face-to-face review of their work. Brazel et al. (2004) compare the judgments of auditors expecting in-person reviews (face-to-face preparers) with the judgments of auditors expecting electronic reviews (e-review preparers). They find that face-to-face preparers are less likely to be influenced by prior year judgments (i.e., reduced anchoring) and provide higher quality judgments. This result is likely due to differing demands (e.g., demands relating to perceptions of accountability and synchronicity of communication) perceived by preparers in the two review conditions. Specifically, face-to-face preparers perceive greater demands and thus spend more time and

effort preparing their workpapers (i.e., are more effective but less efficient) than e-review preparers.

Payne (2004) also finds that, relative to staff auditors anticipating a written review, those expecting a face-to-face review devote greater effort, resulting in improved performance of complex tasks.² Payne et al. (2006) conclude that anticipation of a review-by-interview (in which face-to-face discussions were expected) leads to greater preparer focus on more cognitively demanding procedures and in turn better preparer performance than anticipation of a written review (with no face-to-face discussion). These findings suggest that preparers perceive reviews involving in-person (on-site) interaction with their reviewer as more demanding and therefore provide more pre-review cognitive effort.

Although the review method appears to affect staff auditor process and output, it is possible that the ensuing review mitigates any quality issues arising from differing review expectations. Agoglia et al. (2006) matches staff auditors with reviewers, manipulating only the expectation of review mode. Reviewers matched with staff expecting a face-to-face review made higher quality judgments than reviewers matched with staff expecting electronic review. Further, their results suggest that reviewers are unable to recognize quality differences induced by different anticipated review formats and thus do not compensate by generating more review notes or by having staff do more rework. Given these findings suggesting that the review itself does not mitigate the workpaper quality effects that result from differing review modes, the reviewer's choice of review mode appears critical. However, in order for auditors to respond to contextual features of a task by altering their choice of review format, they must, *a priori*, perceive differences in the relative advantages and disadvantages of alternative modes of

² While Payne (2004) does not investigate electronic interaction during review, a written review with no face-to-face interaction (as used in her study) is likely quite similar in terms of timing and expected response, with the medium (paper versus electronic file) being the primary difference.

interacting (e.g., effectiveness versus convenience of communication), and we suspect that they will (Daft et al. 1987; Kock 2005). Specifically, we posit that reviewers perceive in-person interaction during review as more effective and electronic interaction as more convenient.

To provide support for these expectations, we surveyed 23 audit managers and partners from international and large regional accounting firms regarding their beliefs about in-person and electronic communication during review.³ The results of this survey are reported in Table 1. We asked participants to provide, on seven-point scales, their perceptions regarding review mode effectiveness (where 1 = “in-person reviews less effective”, 4 = “about the same”, and 7 = “in-person more effective”) and convenience (where 1 = “in-person reviews less convenient”, 4 = “about the same”, and 7 = “in-person more convenient”).⁴ For the effectiveness question, the mean response was 5.61, which is different from the midpoint of 4 at $p = .050$. Further, 20 out of 23 (87.0%) participants indicated that they believe in-person reviews are more effective (i.e., indicated a response greater than the mid-point). A binomial test of this proportion suggests a significant reviewer perception of in-person reviews as more effective ($p < .001$). In contrast, participants tended to perceive electronic reviews as more convenient, with a mean response of 2.61 (different from the midpoint at $p = .066$). Additionally, 19 out of 23 (82.6%) participants indicated that they believe electronic reviews are more convenient (i.e., indicated a response less than the mid-point). Again, a binomial test of this proportion suggests a significant perception of electronic reviews as more convenient ($p < .001$). Responses to open-ended questions help illustrate these results. For example: 78% of participants stated that issues of timing and location

³ An in-person review was defined as a review where the reviewer is in the same location as the staff member when transferring review notes (allowing for discussion of the review comments and audit work with these individuals). An electronic review was defined as a review where review comments are sent via email or some other form of electronic communication.

⁴ For purposes of the survey, we define an effective review as one that identifies inadequacies and weaknesses in the work performed by a preparer and provides guidance to the preparer about how to remedy those inadequacies and weaknesses. A convenient review minimizes reviewer workload pressures (e.g., eases scheduling issues, reduces reviewer travel time, permits review of multiple jobs concurrently or from a single location).

affect their choice; 52% stated that multiple engagements increase likelihood of choosing electronic review; 26% stated that more complicated/risky issues lead to increased likelihood of in-person reviews; 39% believe that in-person interaction allows for clearer communication and fewer mistakes. Taken together, the results of this survey suggest that reviewers balance effectiveness and convenience when deciding how to conduct their review.

[Insert Table 1]

Risk and Review Mode Choice

Contextual and social factors (e.g., distance between communication partners, degree of interpersonal risk involved in the communication, and accountability to others) can influence the medium of communication chosen (Webster and Trevino 1995). As communication media have varying levels of social presence (e.g., degree of synchronicity and verbal/paraverbal cues), choice of medium may depend, in part, on the contextual/social factors of the particular task at hand. One such factor may relate to the risk associated with the issue under discussion. For example, when a task carries greater risk, a medium with more social presence, such as face-to-face communication, is typically preferred (Nöteberg et. al. 2003). Communication media with less social presence are more likely to result in message misinterpretation, and thus are often less desirable under conditions of heightened risk (Kock 2005).

We choose to investigate the relationship between misstatement risk and choice of review format because auditor risk assessments should have a primary effect on the conduct of the audit (AICPA 2006a). Prior research indicates that auditors typically respond to heightened risk by increasing audit effort, with the expectation that this refocusing of effort will favorably influence audit effectiveness (e.g., Biggs et al. 1988; Bell et al. 1994; Davidson and Gist 1996; Mock and Wright 1999; Mueller and Anderson 2002). With respect to workpaper review, the professional

literature suggests that reviewer effort should be allocated on the basis of risk associated with each area/account (e.g., Label and Arens 1984; Ernst & Young 1993; Price Waterhouse 1993; AICPA 2006b). The effectiveness/efficiency trade-off would then be adjusted across accounts as reviewer effort is shifted away from areas of lower risk to those of higher risk (Sprinkle and Tubbs 1998). Depending on the risk associated with the task, reviewers may also shift their effort between, for example, writing review notes, performing further procedures/evidence evaluation, traveling to the client, and determining the sufficiency of evidence gathered by the preparer (Sprinkle and Tubbs 1998). Prior research appears to corroborate the use of such a “shifting” approach in audit practice (Bamber and Bylinski 1987; Bamber et al. 1988). Further, results of recent studies indicate that, for both preparers and their reviewers, changing the mode of review represents a shift in focus as face-to-face review typically leads to higher quality judgments and greater effort/focus on relevant, current year evidence than electronic review (Brazel et al. 2004; Agoglia et al. 2006). Thus, if managers perceive in-person interaction as more effortful/effective, we would expect reviewers to be more likely to choose to perform their reviews in person when the risk of misstatement is high (versus low) and the potential benefits of this increased effort are greatest. This leads to the following hypothesis:

- H1: Reviewers will be more likely to review workpapers in-person (as opposed to electronically) when risk of misstatement is high than when risk is low.

Workload Pressure and Review Mode Choice

Another contextual factor that may affect an individual’s choice of communication medium is the intensity of the individual’s current workload (or “workload pressure”). Examining the effect of workload on audit decision making is particularly relevant given recent changes in the audit profession that have the potential to substantially increase the workload

pressure placed on auditors. First, the Sarbanes Oxley Act of 2002 (U.S. House of Representative 2002) and Auditing Standard No. 2 (PCAOB 2004) have expanded the audits of publicly traded corporations by including an attestation on the effectiveness of internal controls over financial reporting. Second, SEC rule 33-8644 (SEC 2005) substantially reduces the 10-K filing period for large accelerated filers and accelerated filers from 90 days to 60 and 75 days, respectively, for fiscal years ending on or after December 15, 2006. For many auditors, this legislation may lead to a truncation of the busy season and require auditors to manage more engagements contemporaneously. Lastly, audit firms have recently proposed expansion of their audits to include forensic audits specifically designed to detect fraudulent financial reporting (Reilly 2006), potentially compressing workloads even further.

In the wake of this increased regulation and oversight, the workload of auditors at large public accounting firms has increased dramatically, resulting in increased employee turnover, putting greater strain on those with experience that remain (e.g., McGee 2005; Gullapalli 2005). This “quantitative overload” aspect of workload can result in pressures that are independent of those produced through imposing time constraints, such as being overwhelmed by the feeling that there is just too much work to do, without concern for any specific deadlines or constraints (French and Caplan 1972; Sutherland and Cooper 1988; DeZoort and Lord 1997). However, similar to time pressure (e.g., McDaniel 1990; Solomon and Brown 1992; Choo 1995), workload pressure may affect how individuals conduct their work (DeZoort and Lord 1997). Recent archival research links high workload compression with lower quality audits, suggesting that the intense demands of the busy season can diminish employee performance (Lopez-Acevedo 2005). The auditing profession has also expressed concerns about the effect of workload pressure and deadlines on audit quality (Lopez-Acevedo 2005; Gullapalli 2005).

As communication synchronicity and convenience varies with the medium, reviewers may have preferences for a particular mode of review depending on their current workloads. For example, e-mail communication typically allows for efficiencies as individuals can divide their attention between required tasks while waiting for the other parties to respond (Nöteberg et. al. 2003). With high workload pressure (and competing client needs), managers may prefer electronic review as it allows them to move the engagement forward, yet still affords them the opportunity to address other tasks/engagements while awaiting the preparer's response. Further, an electronic review can be efficient in that it can save travel time to get to the client to interact with the preparer. Thus, when saddled with a heavy workload and many tasks requiring their attention, reviewers may attempt to relieve some of this pressure by choosing a more convenient review method, increasing preference for electronic reviews. This leads to the following hypothesis:

H2: Reviewers will be more likely to review workpapers electronically (as opposed to in-person) when workload pressure is high than when workload pressure is low.

The Interactive Effect of Risk and Workload Pressure

Prior research suggests that, when under greater external pressures (e.g., fee pressure), auditors are more likely to reduce effort for low risk tasks than for high risk tasks (Houston 1999). Thus, it may be that risk and workload pressure have an interactive effect on a reviewer's choice of electronic versus face-to-face communication during review. If reviewers regard electronic review as less effective, they may be less willing to utilize it when the risk of misstatement is high, regardless of their workload pressures. When risk is high, reviewers may be less sensitive to workload pressures, given the greater risk of litigation that goes along with a higher risk client, and may choose to deal with high workload pressures either by devoting more

attention to this client/task or by shifting their effort from less risky clients/tasks (Houston 1999). In contrast, reviewers may regard low risk tasks as an opportunity for efficiencies, particularly during periods in which they have several other engagements/tasks to attend, and choose to communicate electronically when appropriate. Thus, we expect client risk and auditor workload pressure will interact to affect the reviewer's choice of review method. Specifically, auditors will be most likely to review electronically when confronted with a low risk client *and* high workload pressure. Such a setting would be the most likely to provide the reviewer with the convenience benefits of electronic communication while minimizing the potential risk to the firm. We therefore test the following hypothesis:

- H3: The difference between the likelihoods of reviewers under high and low workload pressure choosing to review electronically will be greater when the risk of misstatement is low than when it is high.

III. METHOD

Participants

Participants were 60 practicing auditors from international, national, and large regional firms. Discussions with firm representatives revealed that auditors with less than four years audit experience are unlikely to commonly make the type of decision contemplated in our study. Therefore, all participants had a minimum of four years experience, with an average of 14.5 years experience.⁵

Experimental Task and Procedure

Participants were provided with a case which placed them in the role of reviewer on a hypothetical audit engagement. The case materials included background information on the

⁵ There are no significant differences ($p > 0.10$) for participants across the experimental conditions for any of the demographic variables (e.g., experience, professionals in office, audit/review clients served each year).

client, along with audited prior year and unaudited current year financial information.

Participants were asked to assume that they are planning the year-end audit work for the sales and collection cycle and were informed that interim audit work, including all necessary tests of controls, had already been performed. Results of these tests were provided along with evidence regarding misstatement risk for the cycle and information about their current workload (the manipulations, discussed below). After examining the case materials, participants then indicated how likely they would be to plan to review their staff member's substantive audit work done on the sales and collections cycle in person versus electronically. Participants also set budgets (in hours) for substantive testing by the staff auditor and for their review. Participants then answered a series of case-related and demographic questions, including checks of the manipulations.

Independent Variables

Two independent variables (risk of misstatement and workload pressure) were manipulated between participants resulting in a 2×2 complete factorial design. Risk of misstatement was manipulated as low or high. In the low risk condition, risk assessments (and supporting documentation) provided to participants indicated that inherent risk and control risk were assessed as low in both the current and prior years. In the high risk condition, inherent and control risks are both assessed as high in the current and prior years, and supporting documentation reflected these assessments. Supporting documentation for risk assessments included, for example, evidence relating to the number of non-routine transactions, stock option plans, and related-party transactions. Workload pressure was also manipulated as low or high, with participants in the low (high) pressure condition informed that they will be concurrently

serving as engagement manager/partner on two (nine) other engagements.⁶ Participants were randomly assigned to one of the four treatment groups.

IV. RESULTS

Results relating to our three hypotheses are analyzed within a 2x2 ANOVA framework (risk of misstatement by workload pressure), with review mode likelihood decisions serving as the dependent variable. Due to the directional nature of expectations, all tests of hypotheses are one-tailed. Manipulation checks for both independent variables indicate that participants generally understood the manipulations.⁷

Hypotheses 1 and 2 relate to main effects of risk of misstatement and workload pressure. Specifically, H1 predicts that, when risk is high, reviewers will be more likely to review workpapers in-person than when risk is low. H2 predicts that reviewers will be more likely to review electronically when workload pressure is high than when it is low. Participants recorded their review mode likelihood decisions on a 10-point scale (where 1 = “I would definitely do an in-person review” and 10 = “I would definitely do an electronic review”). Table 2 reports ANOVA results using participants’ scaled review mode decisions as the dependent variable. Results reveal a significant and directionally consistent main effect of risk of misstatement on reviewers’ review mode likelihood decisions, with means of 2.75 and 4.47 for the high and low risk conditions, respectively ($F = 14.23$, $p = .001$), providing support for H1. Similarly, results reveal a significant and directionally consistent main effect of workload pressure on the review

⁶ Discussions with audit partners and managers indicate that two (nine) other engagements represent relatively low (high) workload pressure.

⁷ For misstatement risk, two participants in the low risk condition indicated that they perceived both inherent and control risk as medium (none considered risk high). All participants in the high risk condition indicated that they perceived inherent and control risk to be high. For workload pressure, two participants in the low pressure condition indicated that they perceived their workload pressure to be high. Again, all participants in the high pressure condition indicated a perception that their workload was high. Removing participants who did not respond to the manipulation checks as intended does not affect the conclusions drawn.

mode likelihood decisions (means = 2.93 and 4.28 for low and high pressure groups, respectively; $F = 8.80, p = .002$), providing support for H2.⁸

[Insert Table 2]

Hypothesis 3 predicts that, beyond the observed main effects, risk of misstatement and workload pressure will have an interactive effect on how reviewers choose to conduct their reviews. Specifically, H3 predicts that misstatement risk will moderate the effect of workload pressure such that, when risk is high, the effect of workload pressure is reduced. Results of the ANOVA presented in Table 2 indicate a significant interactive effect of risk and pressure on participants' review mode likelihood decisions ($F = 5.32, p = .012$). The cell means presented in Panel B of Table 2 and Figure 1 demonstrate the nature of this moderating interaction. While high workload pressure increases the likelihood that reviewers will choose to communicate electronically with their preparers during review, this effect is less when the risk of misstatement is high than when it is low.⁹ These results provide support for H3.

[Insert Figure 1]

Extent of Audit Work: Hours Budgeted for Substantive Testing and for Review

While, in the main analysis above, we consider how the review process is conducted (i.e., the *nature* of the review process), we now consider the *extent* of audit work. We examine whether or not the extent of audit work (i.e., hours budgeted for substantive testing to be conducted by audit staff and hours budgeted for review) is affected by the risk of misstatement and/or the reviewer's current workload pressure. Increased inherent and control risk should cause

⁸ Dichotomizing participants' scaled responses at the midpoint (as a measure of the practical significance of their review mode choice) provides additional support for H1 and H2. ANOVA results reveal significant main effects of both misstatement risk ($F = 12.52, p = .001$) and workload pressure ($F = 6.48, p = .006$) on the dichotomized measure. Much of these effects, however, appear to be attributable to the condition where misstatement risk is low and workload pressure is high.

⁹ Results are similar for the risk/workload pressure interaction when reviewers' review mode decisions are dichotomized ($F = 12.20, p = .001$).

the auditor to modify the extent, nature, and timing of audit work (AICPA 2006a). Additionally, while our results indicate that increased workloads affect the nature of the review process (H2), it is also worth considering whether workload pressure affects the extent of audit work. By examining the number of hours reviewers budget for substantive testing (to be conducted by audit staff) and for their reviews, we are able to consider whether, in addition to altering the nature of their reviews, they also alter the extent of substantive testing and their review time.

Table 3 presents results of two 2x2 ANCOVAs (misstatement risk by workload pressure), with review mode choice (i.e., the reviewers' responses indicated on the review mode likelihood scale) included as a covariate and budgeted hours for substantive testing and for review, separately, serving as the dependent variables. Consistent with expectations and with audit guidance, ANCOVA results indicate that reviewers budget significantly more hours for substantive testing when misstatement risk is high than when it is low (means = 149.5 and 127.6 hours, respectively; $F = 9.40$, $p = .002$). Reviewers in the high risk condition also budgeted significantly more time for their workpaper reviews (means = 17.1 and 13.6 hours; $F = 5.35$, $p = .012$). Somewhat reassuringly, workload pressure did not significantly affect either the number of hours reviewers budgeted for substantive testing (means = 140.8 and 136.2 for low and high pressure, respectively; $F = .43$, $p = .516$) or budgeted review time (means = 16.2 and 14.5 for low and high pressure, respectively; $F = 1.24$; $p = .270$). Further, workload pressure did not interact with misstatement risk to affect either budgeted substantive testing ($F = 0.11$, $p = .747$) or budgeted review time ($F = 0.01$, $p = .919$). It is interesting to note that the covariate, their choice of review format, did not affect the number of hours reviewers budgeted for either substantive testing or review. This suggests that altering the nature of the review does not influence reviewers' judgments about the extent of audit work to be performed. That is, the move

toward a potentially more effective in-person review under higher risk (H1) does not prevent auditors from also appropriately increasing the extent of substantive testing and related review time. Also, while our survey and H2 results suggest that electronic review provides convenience, the insignificant covariate in Panel B (Table 3) indicates that use of electronic review does not reduce the time reviewers devote to the review task.

[Insert Table 3]

V. DISCUSSION AND CONCLUDING REMARKS

Changes in the technological environment in which audits are conducted have increased reviewers' options of how to interact with their audit teams. Reliance on electronic workpapers, as well as the use of electronic communication between audit team members, has the potential to influence the audit team judgment process (e.g., Baltes et al. 2002; Agoglia et al. 2006). As reviewers typically have a great deal of discretion over how to conduct their reviews, the choice of review format should be appropriately viewed as a controllable audit input. Prior research indicates that in-person (or face-to-face) reviews bring to bear different environmental pressures on preparers than electronic reviews, resulting in qualitatively different workpapers and judgments (Brazel et al. 2004; Agoglia et al. 2006). Thus, the reviewer's choice of review mode could impact the quality of the audit team's work. Our study extends the literature on the audit review process by examining reviewers' choice of review mode and by considering factors that influence that choice.

Consistent with expectations, our results indicate that risk of misstatement and workload pressure affect participants' review mode choices. Specifically, reviewers are more likely to choose to conduct their reviews in-person (versus electronically) when the risk of misstatement

is high than when it is low. Our results also indicate that reviewers are more likely to conduct their reviews electronically (as opposed to in-person) when workload pressure is high than when it is low. These findings suggest that reviewers perceive reviews involving face-to-face interaction to be more appropriate when effectiveness of procedures is essential and consider electronic review to be a practicable way to cope with workload pressures associated with a hectic client schedule. Further, we find that risk and workload pressure interact to affect reviewers' likelihood of using the more convenient electronic mode of review. Results indicate that misstatement risk moderates the effect of workload pressure on reviewers' likelihood of choosing to review electronically such that, when risk is high, the effect of workload pressure is reduced. In addition to these findings regarding the *nature* of the review, we also find that the risk of misstatement, but not workload pressure, affects the *extent* of planned audit work.

Our findings have implications for both practice and future research. For example, the IFA has acknowledged that reviewers in today's audit environment have alternative ways in which to conduct their reviews, and prior research suggests that the choice of review format has implications for workpaper quality (e.g., Brazel et al. 2004; Payne 2006; Agoglia et al. 2006; Payne et al. 2006). The results presented here advance our understanding of the factors that influence this choice. Our findings provide insight to firms, regulators, and inspectors regarding the impact of workload pressure and misstatement risk on how audit workpaper reviewers conduct their reviews. These issues are increasingly relevant given recent changes to the regulatory environment (e.g., Section 404 compliance, the Sarbanes-Oxley Act of 2002, and Statement on Auditing Standards No. 99) that emphasize the auditor's role in detecting fraud/misstatements and exacerbate traditional workload pressures during busy times of the year (McGee 2005; Gullapalli 2005). While we examine two factors that can influence the review

mode choice, future research could investigate other factors that affect this choice and its resulting implications for the conduct of review and workpaper quality. Such research will further our understanding of the factors that influence the choice of review format as well as the impact of this choice on the review process.

REFERENCES

- Agoglia, C. P., T. Kida, and D. M. Hanno. 2003. The effects of alternative justification memos on the judgments of audit reviewees and reviewers. *Journal of Accounting Research* 41 (March): 33-46.
- Agoglia, C. P., R. C. Hatfield, and J. F. Brazel. 2006. The effects of audit review format on review team judgments. Working Paper, Drexel University.
- American Institute of Certified Public Accountants (AICPA). 1978. *Statement on auditing standards No. 22: Planning and Supervision*. New York, NY.
- American Institute of Certified Public Accountants (AICPA), 2002. *Consideration of Fraud in Financial Statements*, Statement on Auditing Standards No. 99. New York, NY.
- American Institute of Certified Public Accountants (AICPA). 2006a. *Statement on auditing standards No. 107: Audit risk and materiality in conducting an audit*. New York, NY.
- American Institute of Certified Public Accountants (AICPA). 2006b. *Statement on auditing standards No. 110: Performing audit procedures in response to assessed risks and evaluating the audit evidence obtained*. New York, NY.
- Asare, S. K., and L. McDaniel. 1996. The effect of familiarity with the preparer and task complexity on the effectiveness of the audit review process. *The Accounting Review* 71 (April): 139-159.
- Baltes, B. B., M. W. Dickson, M. P. Sherman, C. C. Bauer, and J. S. LaGanke. 2002. Computer-mediated communication and group decision making: A meta-analysis. *Organizational Behavior and Human Decision Processes* 87 (January): 156-179.
- Bamber, E. M., and J. H. Bylinski. 1987. The effects of the planning memorandum, time pressure and individual auditor characteristics on audit managers' review time judgments. *Contemporary Accounting Research* 3 (Fall): 501-513.
- Bamber, E. M., L. Bamber, and J. Bylinski. 1988. A descriptive study of audit managers' working paper review. *Auditing: A Journal of Practice & Theory* 7(Spring): 137-149.
- Bell, T., W. R. Knechel, and J. Willingham. 1994. An exploratory analysis of the determinants of audit engagement resource allocations. Proceedings of Deloitte & Touche/University of Kansas Symposium on Auditing Problems, 49-67. Lawrence, KS: University of Kansas.
- Biggs, S. F., T. J. Mock, and P. R. Watkins. 1988. Auditor's use of analytical review in audit program design. *The Accounting Review* 63(1): 148-161.

- Brazel, J. F., C. P. Agoglia, and R. C. Hatfield. 2004. Electronic versus face-to-face review: the effects of alternative forms of review on auditors' performance. *The Accounting Review* 79 (4): 949-966.
- Choo, F. 1995. Auditors' judgment performance under stress: A test of the predicted relationship by three theoretical models. *Journal of Accounting, Auditing & Finance* 10 (Summer): 611-641.
- Daft, R. L., R. H. Lengel, and L. K. Trevino. 1987. Message equivocality, media selection, and manager performance: Implications for information systems. *MIS Quarterly* (September): 354-366.
- Davidson, R., and W. Gist. 1996. Empirical evidence on the functional relation between audit planning and total audit effort. *Journal of Accounting Research* (Spring): 111-124.
- DeZoort, F. T. and A. T. Lord. 1997. A review and synthesis of pressure effects research in accounting. *Journal of Accounting Literature* 16: 28-85
- Emby, C., and M. Gibbins. 1988. Good judgment in public accounting: Quality and justification. *Contemporary Accounting Research* 4 (Spring): 287-313.
- Ernst & Young. 1993. *Audit Manual*. Vol. 2. New York: Ernst & Young.
- French, J. R., and R. D. Caplan. 1972. Organizational stress and individual strain. In *The Failure of Success*, edited by A. J. Marrow. New York, NY: AMACON: 30-66.
- Gullapalli, D. 2005. Take this job and ...file it; burdened by extra work created by the Sarbanes-Oxley Act, CPAs leave the Big Four for better life. *The Wall Street Journal*, New York, May 4, pg C1.
- Houston, R. W. 1999. The effects of fee pressure and client risk on audit seniors' time budget decisions. *Auditing: A Journal of Practice & Theory* 18 (2): 70-86.
- International Federation of Accountants (IFA). 2004. *International Standard on Auditing 300 (Revised): Planning an Audit of Financial Statements*. New York, NY.
- Johnson, V. E., and S. E. Kaplan. 1991. Experimental evidence on the effects of accountability on auditor judgments. *Auditing: A Journal of Practice and Theory* 10 (Supplement): 96-107.
- Kennedy, J. 1993. Debiasing audit judgment with accountability: A framework and experimental results. *Journal of Accounting Research* 31 (Autumn): 231-245.
- Kock, N. 2005. Media richness or media naturalness? The evolution of our biological communication apparatus and its influence on our behavior toward e-communication tools. *IEEE Transactions on Professional Communication* 48 (2):117-130.

- Koonce, L., U. Anderson, and G. Marchant. 1995. Justification of decisions in auditing. *Journal of Accounting Research* 33 (Autumn): 369-384.
- Label, W. and A. Arens. 1984. Guidelines for more effective workpaper review. *Practical Accountant* 17 (April): 49-54.
- Lopez-Acevedo, D. M. 2005. The effect of workload compression on audit quality. Working Paper, University of Arkansas.
- McDaniel, L. 1990. The effects of time pressure and audit program structure on audit performance. *Journal of Accounting Research* 28 (Autumn): 267-285
- McGee, S. 2005. CPA recruitment intensifies as accounting rules evolve. *The Wall Street Journal*. New York, March 22, Pg. B-6.
- Mock, T. J. and A. Wright. 1993. An exploratory study of auditors' evidential planning judgments. *Auditing: A Journal of Practice & Theory* 12(2): 39-61
- Mueller, J. M., and J. C. Anderson. Decision aids for generating analytical review alternatives: The impact of goal framing and audit-risk level. *Behavioral Research in Accounting* (14): 157-177.
- Murthy, U. S. and Kerr, D. S. 2004. Comparing audit team effectiveness via alternative modes of computer-mediated communication. *Auditing: A Journal of Practice & Theory* 23 (1): 141-152.
- Nöteberg, A, T. L. Benford, and J. E. Hunton. 2003. Matching electronic communication media and audit tasks. *International Journal of Accounting Information Systems* 4: 27-55.
- Payne, E. A. 2004. An examination of audit workpaper review methods and other factors affecting reviewee performance. Working paper, Xavier University.
- Payne, E. A., R. J. Ramsay, and E. M. Bamber. 2006. The effect of real-time review by interview on auditors' procedures and effectiveness. Working paper, University of Mississippi.
- Public Company Accounting Oversight Board (PCAOB). 2004. Auditing Standard No. 2, an audit of internal control over financial reporting in conjunction with an audit of financial statements. Washington, DC.
- Price Waterhouse. 1993. *Audit Guidance Series* Vol. 1: The Price Waterhouse Audit. New York, NY: Price Waterhouse.
- Reilly, D. 2006. Auditing firms urge new ways to detect fraud: Forensic audit designed to root out wrongdoing is suggested in policy paper. *The Wall Street Journal*. (November 8, 2006): C3.

- Rich, J. S., I. Solomon, and K. T. Trotman, 1997. The audit review process: A characterization from the persuasion perspective. *Accounting, Organizations and Society* 22 (July): 481-505.
- Securities and Exchange Commission (SEC). 2005. Release No. 33-8644, Revisions to accelerated deadlines for filing periodic reports.
- Shumate, J. R., and Brooks, R. C. 2001. The effect of technology on auditing in government: A discussion of the paperless audit. *The Journal of Government Financial Management* 50 (Summer): 50-55.
- Solomon, I. and C. Brown. 1992. Auditors' judgments and decisions under time pressure. An illustration and agenda for research. In *Proceedings of the 1992 Deloitte & Touche/ University of Kansas Symposium on Audit Problems*, edited by R. Srivastava. Lawrence, KS: University of Kansas.
- Sprinkle, G. B. and R. M. Tubbs. 1998. The effects of audit risk and information importance on auditor memory during working paper review. *The Accounting Review* 73(4): 475-502.
- Sutherland, V. J., and C. L. Cooper. 1988. Sources of work stress. In *Occupational Stress: Issues and Developments in Research*, edited by J. Hurrell, Jr., L. Murphy, S. Sauter, and C. L. Cooper. New York, NY: Taylor & Francis: 3-40.
- Tan, H., and A. Kao. 1999. Accountability effects on auditors' performance: The influence of knowledge, problem-solving ability, and task complexity. *Journal of Accounting Research* 37 (Spring): 209-223.
- U.S. House of Representatives. 2002. The Sarbanes-Oxley Act of 2002. Public Law 107-204 [H. R. 3763]. Washington, D.C.: SEC.
- Webster, J. and L. K. Trevino. 1995. Rational and social theories as complementary explanations of communication media choices: two policy-capturing studies. *Academy of Management Journal* 38(6): 1544-1572.
- Wilks, T. J. 2002. Predecisional distortion of evidence as a consequence of real-time audit review. *The Accounting Review* 77 (1): 51-71.

Figure 1
Effect of Misstatement Risk and Workload Pressure on Review Mode Likelihood Decision

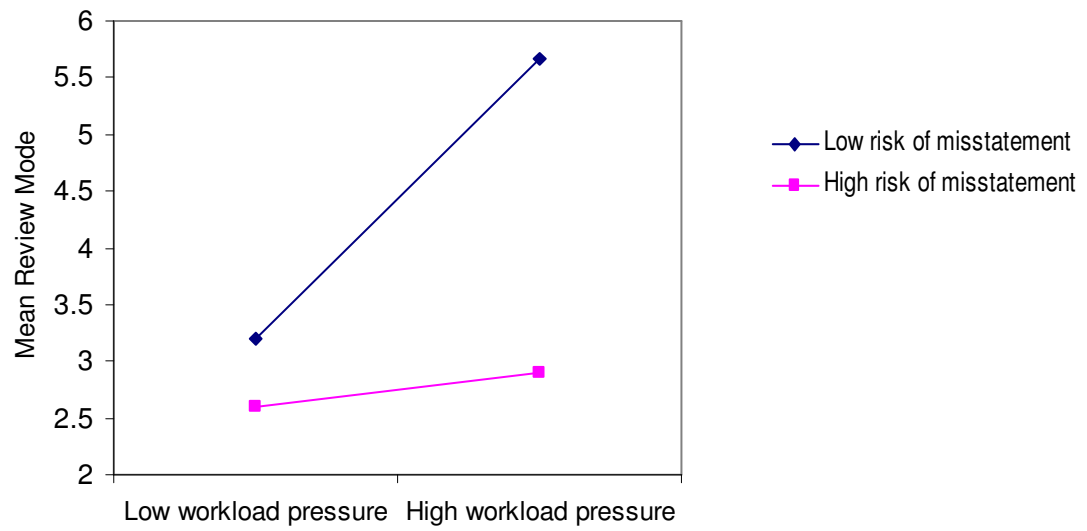


Table 1
Reviewer Perceptions of Review Modes: Manager/Partner Survey Results (n = 23)

<i>Panel A: In-Person vs. Electronic Review</i>				
Measure ^a	Mean	Std Deviation	Difference from Middle of Scale t statistic	p-value
Relative Effectiveness	5.61	0.941	1.71	.050
Relative Convenience	2.61	0.891	1.56	.066

<i>Panel B: Dichotomized Responses^b</i>			
	Count	Percentage	Binomial test p-value ^c
In-person Review More Effective	20	87.0%	< .001
Electronic Review More Convenient	19	82.6%	< .001

^a Relative Effectiveness (Convenience) is measured on a seven-point scale where 1 = In-person reviews less effective (convenient) and 7 = In-person reviews more effective (convenient), with the midpoint of 4 labeled “about the same.”

^b We interpret any value greater than the midpoint to mean that the participant perceived in-person review to be more effective (convenient). We interpret any value less than the midpoint to mean that the participant perceived electronic review to be more effective (convenient). Thus, these counts and percentages do not include responses at the midpoint.

^c These two-tailed tests of proportions assume that the random chance of “success” will be 3/7, rather than 50%, since the midpoint of the scale is not considered a success. A response is considered a success if it is on the predicted side of the scale (e.g., a response of 5, 6, or 7 if “in-person review” was expected).

TABLE 2
Review Mode Likelihood Decision^a (n = 60)

Panel A: ANOVA Results

Independent Variable	df	F-Statistic	p-value ^b
Risk of Misstatement	1	14.23	.001
Workload Pressure	1	8.80	.002
Interaction	1	5.32	.012

Panel B: Mean (Standard Deviation)^c

	Low Workload Pressure	High Workload Pressure	Row Means
Low Risk	¹ 3.26 (1.58)	² 5.67 (2.32)	4.47
High Risk	³ 2.60 (1.84)	⁴ 2.90 (1.07)	2.75
Column Means	2.93	4.28	

^a *Review Mode Likelihood Decision* relates to participants' preferences to review their preparers in-person or electronically. On a ten-point scale, participants indicated whether they were more likely to review the preparer "in-person (i.e., allowing for face-to-face interaction and discussion of review notes) or electronically (i.e., sending the comments and notes via email or some other form of electronic communication)", with a response of 1 labeled "I would definitely do an in-person review" and a response of 10 labeled "I will definitely do an electronic review".

^b p-values are based on one-tailed tests since expectations were directional.

^c For all cells (1-4), n = 15.

TABLE 3
Budgeted Hours for Substantive Testing and Review (n = 60)

Panel A: ANCOVA Results for Hours Budgeted for Substantive Testing^a

Independent Variable	df	F-Statistic	p-value
Risk of Misstatement	1	9.40	.002 ^c
Workload Pressure	1	0.43	.516
Interaction	1	0.11	.747
Covariate (Review mode choice)	1	0.00	.953

Panel B: ANCOVA Results for Hours Budgeted for Review^b

Independent Variable	df	F-Statistic	p-value
Risk of Misstatement	1	5.35	.012 ^c
Workload Pressure	1	1.24	.270
Interaction	1	0.01	.919
Covariate (Review mode choice)	1	0.05	.821

^a For the dependent variable *Hours Budgeted for Substantive Testing*, participants were asked to indicate the number of hours they would budget for substantive testing of the sales and collection cycle by audit staff.

^b For the dependent variable *Hours Budgeted for Review*, participants were asked to indicate the number of hours they would budget for their review of substantive testing of the sales and collection cycle.

^c p-values for *Risk of Misstatement* are based on one-tailed tests since expectations were directional.