

The Effects of the Internal Control Opinion and Use of Audit Data Analytics on Perceptions of Audit Quality, Assurance, and Auditor Negligence

ABSTRACT:

Advanced audit data analytics tools allow auditors to analyze the entire population of accessible client transactions. Though this approach has measurable benefits for audit efficiency and effectiveness, auditors caution that it does not incrementally increase the level of assurance they can provide relative to the fair presentation of the financial statements. We experimentally examine whether the audit testing methodology (audit data analytics versus traditional sampling) and the type of internal control (ICFR) opinion auditors issue (unqualified versus adverse) are signals of audit quality that affect jurors' perceptions of auditor negligence after an audit failure. We predict and find that jurors' perceptions of auditors' personal control over the audit failure influence their assessment of negligence. We also find that when auditors issue an unqualified ICFR opinion, jurors make higher negligence assessments when auditors employ traditional statistical sampling techniques than when they employ audit data analytics. Lastly, we find that when auditors issue an adverse ICFR opinion, jurors attribute less blame to auditors and correspondingly more blame to management and the investor for an audit failure. Our study informs regulators, practitioners, and academics about the contextual effects of the ICFR opinion as well as the perceived assurance and potential litigation effects of using advanced technological tools in the audit.

KEYWORDS: *auditor liability, audit data analytics, audit quality, culpable control model, internal controls*

INTRODUCTION

This study examines whether an auditor's testing methodology and the internal controls over financial reporting (ICFR) opinion affect jurors' perceptions in a litigation setting. Specifically, we examine when the ICFR opinion differentially affects jurors' perception of audit quality (i.e., auditors' use of audit data analytics [ADAs] versus traditional sampling), and the amount of blame attributed to auditors when there is a subsequent audit failure. Two essential drivers of perceived audit quality motivate our study. First, auditors perform integrated audits attesting to both the operating effectiveness of ICFR as well as the fairness of presentation of the financial statements and related disclosures (PCAOB 2007). Regulators emphasize the importance of internal controls and their role in financial reporting quality (PCAOB 2015). Audit quality is enhanced when the auditor's assessment of the ICFR operating effectiveness informs the level of substantive testing and perceptions of the likelihood of a material misstatement in the financial statements. For example, when auditors issue an adverse ICFR opinion they reveal to financial statement users that they identified one or more material weaknesses in the company's system of internal controls and that there is an associated increase in the likelihood of a material misstatement. Accordingly, the ICFR opinion provides an immediate *and* public signal from auditors to stakeholders and could be a signal of the quality of the auditor's work that provides an underlying context within which to evaluate other auditor actions (Ashbaugh-Skaife, Collins, Kinney and LaFond 2009).

A second factor motivating our study is that audit practitioners and standards setters assert that leveraging technology to enable ADA techniques, such as integrating advanced analytics to test a population of transactions versus selecting a sample and manually tracing the associated transactions, can enhance the quality of financial statement audits (Ernst & Young 2014; Deloitte

2016; KPMG 2014; PricewaterhouseCoopers 2015; PCAOB 2016c). These ADAs can be used in any phase of the audit (e.g., tests of controls, substantive tests) can manifest in various forms, and can revolutionize the nature, timing, and extent of audit testing (Brown-Liburd, Issa, and Lombardi 2015; Cao, Chychyla, and Stewart 2015). However, while audit practitioners tout benefits of ADAs for audit quality, they caution that these benefits should increase neither actual nor perceived level of assurance provided in such engagements (EY 2014; KPMG 2014; Deloitte 2016; PwC 2016). Current auditing standards only address the collection of audit evidence using traditional sampling techniques (PCAOB 2016a). As a result, it is important to examine whether financial statement users perceive the use of ADAs as steps taken to enhance audit quality and the associated effects on auditor negligence verdicts.

We assert that a juror setting is best to examine the interactive effects of assurance methodology and ICFR assessments. Absent an audit failure or additional information such as a critical audit matter paragraph (PCAOB 2017), the auditor's report is silent about additional efforts auditors take to improve quality such as the auditor's testing methodology. In a jury trial, part of an auditor's defense is a description of the testing methodology and how their approach relates to the expectations outlined in auditing standards (PCAOB 2016a). We examine whether jurors' awareness of the use of ADAs moderates the effect that the ICFR opinion has on perceptions of audit quality and, ultimately, auditor negligence.

We form our predictions based on blame attribution, as conceptualized in the Culpable Control Model (Alicke 2000), which describes how individuals determine who to hold responsible for an event such as an audit failure. During a trial, jurors are aware that a misstatement occurred; they hear arguments from both parties, learn more about the auditor's approach, and must then determine who is to blame for the plaintiff's loss (e.g., Kadous 2000, 2001; Peecher and Piercey

2008; Backof 2015). While auditors assert that ADAs do not increase the level of assurance they provide, they could benefit from a better understanding of when their methodological decisions complement and or provide a separate signal of quality apart from the ICFR opinion. Because such decisions are within the auditor's purview, understanding when these decisions affect jurors' decision making is essential. The Culpable Control Model allows us to separately examine jurors' assessments of causation, foreseeability, and audit quality intentions, which signal perceptions of the quality of the auditor's work. The combination of these factors permits us to examine jurors' perceptions of auditors' personal control related to the audit failure (Causey and Causey 1991).

While the use of ADAs and an adverse ICFR opinion likely signal higher audit quality, we predict an interactive effect of these signals on jurors' auditor negligence verdicts. Specifically, absent a public and more salient signal provided by an adverse ICFR opinion, jurors will assess auditor negligence as higher after an audit failure when the auditor uses traditional sampling techniques relative to when they use ADAs to execute audit testing and when auditors also issue an unqualified ICFR opinion. Alternatively, we predict no difference in assessed auditor negligence, regardless of the testing approach, when the auditor issues an adverse ICFR opinion.

We conducted a 2x2 between-subjects full factorial experiment and manipulated the auditor's testing methodology (ADAs versus traditional sampling) and the ICFR opinion they issued (unqualified versus adverse) and measured jurors' assessments of auditor negligence and audit quality. We also measured jurors' perceptions of attribution of blame for the audit failure apportioned to auditors (the defendant), management, and investors (the plaintiff). Because ADAs change both the nature of an audit and the extent of audit evidence gathered, we narrow the focus to a type of transactional-based ADA which utilizes advanced technology to identify exceptions in the population based on client specific business rules (i.e., controls) for the revenue cycle. Entire

population testing goes beyond merely testing a larger proportion of transactions. Instead, entire population testing allows auditors to identify *every* transaction that violates client specific business rules, as opposed to estimating the extent of exceptions based on sampling techniques. As such, auditors can perform more efficient analysis on a larger scale by sharpening their focus on those exceptions that are indicative of a higher risk of material misstatement.

Participants were 800 jury-eligible individuals recruited through an online platform. Consistent with the Culpable Control Model and prior research in accounting (e.g., Backof 2015), we find an overall positive relationship between jurors' perceptions of auditors' personal control over the audit failure and their assessment of auditor negligence. For each of the components of personal control, we first find that jurors assessed the most blame to auditors for the audit failure when they issue an unqualified ICFR opinion, irrespective of the testing methodology. Second, we find that jurors perceived the audit failure as most foreseeable when auditors use ADAs and issue an adverse ICFR opinion. Lastly, we find that jurors' perceived auditors' intentions to perform a high quality audit as lowest when they use traditional sampling methods and issue an unqualified ICFR opinion. This finding is consistent with the jurors' overall perceptions of audit quality.

We also predict and find that the ICFR opinion has a direct effect on jurors' negligence verdicts, such that an adverse opinion results in lower perceptions of auditor negligence. We find no direct effect of the audit testing methodology on perceptions of auditor negligence; however, consistent with our expectations, we find an interactive effect which suggests that when an auditor issues an unqualified ICFR opinion jurors assess negligence as higher when the auditor uses traditional sampling techniques versus ADAs. In contrast, when auditors issue an adverse ICFR opinion, jurors assess negligence no differently whether the auditor uses traditional sampling techniques or ADAs. Collectively, our results suggest the ICFR opinion contextualizes jurors'

perceptions of audit quality and differentially affects their evaluation of the testing methodology auditors employ as they assess auditor negligence.

Our study informs regulators, practitioners, and academics about the perceived assurance effects of using one form of ADA in the audit and the impact of the ICFR opinion on litigation outcomes after a misstatement in the financial statements. For regulators, our study suggests that in the presence of a clean ICFR opinion, financial statement users view the use of ADAs, as measured in our study, as employing a higher standard of due professional care and view ADAs as steps taken to ensure higher audit quality. This finding is particularly useful to the PCAOB as it strives to understand the effects of ADAs on the audit and related stakeholders, and to develop auditing standards that more widely promote such innovation in audit engagements (e.g., Zhang, Pawlicki, McQuilken, and Titera 2012). In addition, our study is consistent with prior research which suggests an adverse ICFR opinion provides a salient and useful signal of audit and financial reporting quality (e.g., Wu and Tuttle 2014), and is one of the first to demonstrate the subsequent effect of this signal on litigation outcomes. For audit practitioners, our results lend credence to the notion that utilizing ADAs enhances audit quality; our results also provide some support for the supposition that the increase in audit quality is not associated with an increase in the perceived level of assurance beyond the standard of reasonable assurance about whether the financial statements are free of material misstatement (PCAOB 2007). For researchers, our study highlights when knowledge of auditors' use of advanced technology to enable testing that exceeds current auditing standards affects others' perceptions of audit quality. The application and extension of the Culpable Control Model in our setting provide additional evidence that it helps to effectively examine jurors' evaluations of auditor negligence in light of their assessments of the auditor's personal control (e.g., Gimbar, Hansen, and Ozlanski 2016).

In the remainder of the paper, we review and adapt the Culpable Control Model to our setting, review previous auditor litigation literature, and develop hypotheses. After this, we provide a summary of the experimental methodology and discuss results. Finally, we offer concluding remarks and implications for future research.

THEORY AND HYPOTHESIS DEVELOPMENT

Juror Evaluation of Auditor’s Personal Control and Negligence (Culpable Control Model)

In auditor negligence suits, jurors evaluate whether auditors exercised due professional care in conducting the audit (Causey and Causey 1991). Due professional care (also referred to as the “standard of reasonable care”) suggests that the auditors applied a level of reasoning and judgment like any other careful and competent auditor would in a similar circumstance (PCAOB 2016b). Evaluating due professional care requires jurors to evaluate the steps auditors took to detect a material misstatement as well as any signals auditors provided about the likelihood of a potential material misstatement to financial statement users. During the trial, jurors learn of steps auditors employed to support and improve the quality of their assessments. We describe these steps as private signals, such as the testing methodology employed, because absent an audit failure or a critical audit matter (CAM) paragraph in the auditor’s report, these steps would be unknown to external stakeholders (e.g., Brasel, Doxey, Grenier, and Reffett 2016). As we discuss next, the auditor also provides public signals about the quality of the financial statements. We consider the internal control over financial reporting (ICFR) and audit opinions as public signals. In our study, we focus on the interaction of both public and private signals, which allows us to contribute to the prior literature that examines how jurors process information about the conduct of an audit when they assess auditor negligence.

Assessing auditor negligence also requires jurors to evaluate the role and response of management and investors to signals provided by the auditors that are associated with the audit failure. To investigate these interrelations, we model blame attribution by adapting the Culpable Control Model (*the Model*, hereafter) to an auditor litigation setting (e.g., as in Backof 2015; Alicke 2000). In general, the Model helps to predict and explain the attributions external observers make to the subject of litigation or other judgment, such as defendants in a jury trial, and particularly the subject's intentions (Alicke and Rose 2012). The Model mainly describes circumstances that encourage as well as mitigate blame and permits assessment of the process by which blame and mitigation occur. Key assumptions in the Model are that evidence providing additional information or context concerning an audit failure, for example, is scrutinized by jurors for its impact on auditors' personal control during the conduct of the audit. Personal control pertains to the auditors' ability to influence desired outcomes and to avoid undesirable outcomes such as an audit failure. Components of personal control include intentions, foresight, and causal influence (Backof 2015; Alicke 2000; Fisher 1986). Information about auditors' personal control is spontaneously evaluated by jurors, which permits a blame-validation mode of processing in which evidence concerning the audit failure is reviewed in a way that favors attributing blame to the person or persons who conjure the most negative affect or whose actions confirm unfavorable preconceived expectations (Alicke and Rose 2012; Alicke 2000). In auditor litigation settings, the Model predicts that jurors' assessments of auditors' personal control related to the audit failure directly affect their assessments of auditor negligence (e.g., Backof 2015). We next discuss the public (e.g., ICFR opinion) and private (e.g., audit testing methodology) signals examined in our study and develop our expectations.

ICFR Opinion as a Public Signal of Audit Quality

The auditor's assessment of the operating effectiveness of internal control over financial reporting (ICFR) is an important and immediate *public signal* of financial reporting quality to investors and other financial statement stakeholders. Internal controls are management's responsibility (Sarbanes–Oxley Act 2002) and help companies to reduce, to an acceptable level, the risk of failing to achieve its objectives. Controls do not eliminate risk but rather reduce risk to a level the organization can tolerate (COSO 2013). As a result, like the audit opinion on the financial statements, the ICFR opinion provides only reasonable assurance (PCAOB 2007).

Further, an unqualified ICFR opinion suggests that auditors believe that appropriate controls exist and are operating effectively at the time of testing, while an adverse ICFR opinion suggests that auditors believe that the established controls appear ineffective at the time of testing.¹ The ICFR opinion signals to investors how auditors perceive the quality of the financial statements such that an adverse opinion suggests that a material misstatement may exist in the financial statements investors rely on to make investment decisions (e.g., Wu and Tuttle 2014). While an adverse ICFR opinion signals potentially lower financial reporting quality, it is not a forgone indication that a material misstatement in fact exists. Auditors should, then, adjust their planned audit evidence related to tests of the financial statements in response to their ICFR assessment.

Regulators and audit practitioners recognize, and auditing research corroborates, that the ICFR opinion is an integral signal and component of the quality of a company's financial reporting (e.g., Asare, Fitzgerald, Graham, Joe, Negangard, and Wolfe 2013) and could have adverse consequences. For example, adverse ICFR reports issued by management are associated with reduced share prices (Hammersley, Myers, and Shakespeare 2008) and higher costs of capital

¹ AS No. 2201 (PCAOB 2007) classifies control exceptions as either a control deficiency (least severe), a significant deficiency, or a material weakness (most severe). A material weakness is a single deficiency, or a combination of deficiencies that present a *reasonable possibility* that a material misstatement will not be prevented, or detected and corrected in a timely fashion.

(Ashbaugh-Skaife et al. 2009). Adverse ICFR opinions issued by auditors are associated with increased management turnover (Johnstone, Li, and Rupley 2011). Further, investors associate an adverse ICFR opinion with higher risks of misstatement, greater potential for restatements, more information asymmetry and less transparency, increased the cost of capital, and lower sustainability and predictability of earnings (Lopez, Vandervelde and Wu 2009).

Research on auditor negligence specifically demonstrates that *ex ante* and *ex post* disclosures about auditor judgments and decisions during the ICFR and financial statement audits, such as additional procedures used to increase the likelihood of detection of errors or fraud, affect juror decision making. Focusing on the *ex-ante* disclosure, Brasel et al. (2016) find that jurors assess lower auditor negligence when the auditor signals financial reporting quality concerns through disclosures made in a CAM paragraph. Like the ICFR opinion, a CAM is an *ex ante*, immediate, and publicly-available signal of quality.

An adverse ICFR opinion is an auditors' signal to financial statement users that they identified at least one material weakness in the company's system of internal controls and that they considered the material weakness in determining the nature, timing, and extent of audit tests applied in the audit of the financial statements. We expect that jurors will perceive an adverse ICFR opinion as a salient signal from auditors to stakeholders that the material weakness could diminish the quality of the financial statements. When auditors provide this signal, we expect that jurors will perceive auditors' judgments as appropriate by assigning less blame to the auditor after an audit failure. Further, because management is ultimately responsible for establishing and maintaining an effective system of internal controls, the ICFR opinion will serve as a signal to investors about management's responsibility and role associated with the audit failure. *Ceteris paribus*, an adverse ICFR opinion signals that management's ineffective controls over financial

reporting processes make management at least partially to blame (contributorily negligent) for material misstatements identified after issuance of the financial statements. Formally stated below, we posit that when auditors issue an adverse ICFR opinion, jurors will assign less blame and assess lower negligence to the auditors after an audit failure.

H1: *Jurors' assessment of auditor negligence will be lower when auditors issue an adverse versus an unqualified ICFR opinion.*

Audit Testing: Use of Audit Data Analytics (ADAs) versus Traditional Sampling Techniques

The American Institute of Certified Public Accountants (AICPA) defines ADAs as “the science and art of discovering and analyzing patterns, identifying anomalies, and extracting other useful information in data underlying or related to the subject matter of an audit through analysis, modeling, and visualization for planning or performing the audit” (AICPA 2015). The use of advanced testing methods such as ADAs can occur at any stage of the audit and can significantly transform the process of auditing financial statements, resulting in enhanced audit effectiveness and audit efficiency—both elements and signals of audit quality (Brown-Liburd et al. 2015; Cao et al. 2015). Former Public Company Accounting Oversight Board (PCAOB) board member Steven Harris recently echoed this sentiment, suggesting that “these technological tools could allow auditors to make better decisions and assessments throughout the audit...thereby improving audit quality” (PCAOB 2016c). However, Big 4 firms are careful to acknowledge all associated implications for audit quality (e.g., Earley 2015; Liddy 2015; EY 2015; KPMG 2012).

One form of ADAs focuses on using technology to allow inspection of the entire population of data underlying a company’s financial statements rather than using an appropriate sampling approach (Brown-Liburd et al. 2015; Cao et al. 2015; Murphy and Tysiac 2015; PwC 2015; PCAOB 201b). Testing the entire population potentially results in a more effective and efficient audit and mitigates the efficiency-effectiveness tradeoff associated with traditional sampling

methods. More generally, utilization of ADA tools and techniques allow audit firms to increase the sufficiency, or quantity, of audit evidence, gathered at a similar cost (e.g., Barr-Pulliam 2018; Byrnes, Criste, Stewart, and Vasarhelyi 2014) which also increases audit quality and reduces audit risk. ADA techniques such as entire population testing potentially produce all exceptions in the population from which auditors may further examine all or a sample based on available audit resources. This testing approach allows auditors to focus on higher risk transactions that are more likely to increase the risk of material misstatement. In contrast, traditional sampling requires auditors first identify and then extrapolate (e.g., estimate) the magnitude of sample deviations to the entire population.

Perceptions of ADAs as a (Private) Signal of Audit Quality

Little empirical evidence exists regarding the impact of ADAs on audit quality. Recent studies suggest that some forms of ADAs such as population testing and predictive modeling (Ballou, Grenier and Reffett 2018), different forms of Big Data visualizations (Rose, Rose, Rotaru, Sanderson, and Thibodeau 2019; Rose, Rose Sanderson, and Thibodeau 2017), and continuous auditing (Barr-Pulliam 2018) affect perceptions of audit quality. Closest to the factors we examine in our study, Ballou et al. (2018) examine investor, juror, and peer reviewer perceptions of traditional sampling, ADA population testing, and ADA predictive modeling. They find that jurors view ADA population testing as equally favorable to traditional sampling but view ADA population testing as more favorable than predictive modeling procedures. However, they do not find that audit testing methods affect investors' willingness to invest or peer reviewers' perceptions of audit quality. While Ballou et al. (2018) examine perceptions of ADA and traditional sampling techniques in stark contrast, our study extends their work by examining these perceptions in the

context of a public signal of financial reporting quality (i.e., the auditor assessed ICFR environment) which prior studies suggest may affect juror judgments (Brasel et al. 2016).

Given that ADAs allow auditors to develop more significant insights into a client's business and financial statements (e.g., Rose et al. 2019; Rose et al. 2017), jurors could perceive auditors' examining the entire population of a client's transactions as indicative of a higher quality audit than when auditors employ traditional sampling techniques. Accordingly, jurors will likely perceive auditors' application of ADAs as going beyond the expected standard of performance from auditors in an analogous situation ("due professional care") and as taking steps to perform a higher quality audit (Maksymov and Nelson 2017).² After an audit failure, jurors could be less likely to assess auditors as negligent when auditors employ ADA techniques and could attribute this failure to factors outside the auditors' control, such as management collusion. Conversely, employing ADAs could result in juror perceptions that a competent auditor should have identified an existing material misstatement after testing the full population of transactions.

Failure to identify a misstatement can be perceived as incompetence, which could then lead jurors to assess auditors as more negligent for the subsequent misstatement. Prior auditor liability research suggests that jurors' perceptions of auditor competence are both nuanced and context-dependent when the quality of the audit varies. Awareness of the tactics auditors use to improve detection of misstatements moderates how jurors assess auditor negligence. For example, standards of care to which jurors hold auditors vary with the severity of negligence outcomes (e.g., Kadous 2000; Arel, Jennings, Pany, and Reckers 2012). Prior research also suggests that the timing of the assessment of auditors' standard of care (i.e., before or after jurors learn about steps the auditor took to improve audit quality) also affects jurors' negligence verdicts (Maksymov and

²We use the terms "due professional care" and "standard of care" interchangeably.

Nelson 2017). Prior research is mixed, however, on the effect of audit quality on negligence judgments (e.g., Kadous 2000; Reffett 2010; Arel et al. 2012; Maksymov and Nelson 2017).

Our study specifically extends auditor negligence studies by Reffett (2010) and Maksymov and Nelson (2017). Reffett (2010), using a between-participant design, finds no effect of the *extent* of investigation (whether limited or extensive) when auditors identify a fraud risk. However, the results also suggest that jurors assess auditors as more negligent when auditors identify a fraud risk than when they do not identify the risk and based on that assessment performed no testing. Upon further investigation, Reffett (2010) identified that jurors' assessments were likely unintended. Using a within-participant design, the study results show that jurors were *less* likely to find auditors negligent when they indeed investigated for fraud compared to when they did not investigate for fraud. These results suggest that juror assessment of audit quality and subsequent auditor negligence is contextual and nuanced. In a series of experiments, Maksymov and Nelson (2017) explore these nuances and further examine findings in Kadous (2000) related to jurors' assessment of due professional care. Findings suggest that jurors' perceptions of the extent auditors met a reasonable standard of care and jurors' perceptions of auditors' specific efforts to improve audit quality (using a smaller relative to larger sample size) facilitate how jurors' *ex post* knowledge of a misstatement affects negligence assessments.

We specifically extend these studies by examining the effect of audit quality on jurors' negligence assessments when auditors use advanced technology to examine the entire population of a client's revenue transactions. In Maksymov and Nelson (2017), they proxy higher audit quality by using a large sample size and lower audit quality by a small sample size. The results show that high audit quality reduces the incidences of auditor negligence verdicts. While entire population testing may be perceived as a similar construct, we suggest our setting activates a different

construct because auditors using entire population testing can enhance audit effectiveness by identifying *every* transaction that violates company policy or recorded incorrectly. In other words, the sample size manipulation in Maksymov and Nelson (2017) informs our understanding of tradeoffs between audit efficiency versus audit effectiveness. However, our setting differs in that ADAs enable auditors to increase both efficiency and effectiveness by leveraging technology. Specifically, population testing allows auditors to identify misstatements with greater certainty, rather than extrapolating an error rate identified by focusing on a statistical sample of transactions.

Taken together, the discussion of prior research suggests that in certain contexts, taking steps to improve audit quality can be perceived as a positive signal by jurors. However, it is important to note that non-auditor stakeholders only learn of the audit testing approach in certain extenuating circumstances, such as during litigation or if auditors issue a related CAM. As a result, the testing methodology is a *private* signal of quality because it is unknown to the public otherwise.

The Interactive Effect of Public and Private Signals of Audit Quality

While the ICFR opinion is an *ex ante* signal, from a juror's perspective, as posited in H1, we also expect that an adverse ICFR opinion introduces contributory factors that constrain the effectiveness of audit testing regardless of the testing methodology auditors employ. Consistent with prior literature and especially Reffett (2010), we expect that jurors will evaluate auditors' application of ADAs as going beyond the expected standard of performance (e.g., due professional care) and view this approach as taking steps to perform a higher quality audit. We expect that this *ex post* (or private) audit quality signal will be interpreted in light of other contextual cues of the financial reporting environment, such as the public ICFR opinion.

Prior literature suggests that there are significant implications surrounding the role of management in creating an effective internal control environment over financial reporting and the

extent to which perceptions that management's actions cause the adverse ICFR assessments issued by auditors. For example, Johnstone, Li, and Rupley (2011) find that following an adverse ICFR audit opinion, there is significant turnover in boards of directors, audit committees, and C-suite level management. This finding supports the assertion that stakeholders understand management's role in maintaining an effective internal control environment and the associated effects on financial reporting. Johnstone et al. (2011) also find that the consequences to management are more severe when ICFR deficiencies also expose the organization to potential material misstatements. Consistent with these findings, we expect that when auditors issue a public signal about financial reporting quality vis-à-vis an adverse ICFR opinion, jurors will assess auditors as less negligent and will perceive management as jointly responsible for any material misstatements identified after the completion of the integrated audit. In this adverse ICFR context, jurors will focus more on the signal auditors sent as well as management's responsibility for the misstatement and less on the quality of actions auditors undertook (i.e., audit testing methodology) to identify the misstatement.

However, absent a salient public signal of ineffective ICFR, we expect that jurors will focus more on the private signal of audit quality embodied by the audit testing methodology auditors employed to identify and test for any material misstatements. We expect that when auditors issue an unqualified ("clean") ICFR opinion, jurors will assess auditors as more negligent for a subsequent audit failure when auditors use a lower quality audit methodology (traditional sampling) relative to a higher quality audit methodology (ADA techniques). However, when auditors issue an adverse ICFR opinion, we expect that the strength of this public signal will lead to similar evaluations of the auditor's testing methodology (either traditional sampling or ADA techniques) such that assessed negligence is no different. We state this expectation as follows:

H2: *Jurors will assess auditors as more negligent when they issue an unqualified ICFR opinion and employ traditional sampling versus ADAs; however, when auditors*

issue an adverse ICFR opinion there will be no difference in assessed auditor negligence regardless of the auditors' testing approach.

RESEARCH DESIGN

Participants

We used a between-subjects experiment to examine jurors' assessment of auditor negligence in an audit malpractice suit. We identified jury-eligible participants using Amazon Mechanical Turk (MTurk).³ Prior accounting studies also use MTurk participants (called workers) as a proxy for jurors (Brasel et al. 2016; Grenier, Pomeroy, and Stern 2015; Grenier, Lowe, Reffett, and Warne 2015; Peecher, Reffett, and Zimbelman 2016; Maksymov and Nelson 2017). A total of 800 workers successfully completed the task and provided an accurate randomly-generated survey code. These participants received \$1 (\$800 total). Of 800 workers meeting the inclusion criteria, 222 (27.75%) failed to answer both manipulation checks correctly. The 578 participants who answered both manipulation check questions correctly received a \$0.50 bonus (total of \$289). The total paid to participants was \$1,089 or \$1.36 per worker. Participants completed the task in an average of 27 minutes; as a result, our hourly rate of \$3.03 [calculated as $(\$1.36/27 \text{ minutes}) \times 60 \text{ minutes}$] exceeds the average hourly MTurk wage of \$1.38 (Horton and Chilton 2010).

Of our 800 participants, the mean age was 37.1 years old; 58.0% were female, and 14.8% had a graduate degree. Approximately 11.6% had prior experience serving on a jury, and 23.3% had prior investment experience. Participants in our sample are comparable with those in recent studies eliciting juror negligence judgments in auditor litigation cases (e.g., Lowe, Reckers, and Whitecotton 2002; Backof 2015; Gimbar et al. 2016). Our participants were appropriate given our

³ We use the survey design suggested by Brandon et al. (2014) and Farrell et al. (2017). Also, use of human participants in this study was reviewed and approved by the Institutional Review Board of the respective research institution.

research goals (Libby et al. 2002; Elliott et al. 2007).⁴ Demographic data are presented in Table 1.

[Insert Table 1 Here]

Experimental Materials

In Stage One of the experiment (see Appendix 1), we screened potential participants to assess jury eligibility. Participants moved to Stage Two if they self-reported that they: 1) were U.S. citizens, 2) were at least 18 years of age, and 3) had taken no more than two accounting or finance courses. After reading and accepting the informed consent agreement and reading background information provided in Stage Two, participants receive information about the financial statement auditing process. The instrument explains the internal controls over financial reporting audit, the relationship between internal controls and the substantive testing procedures in the financial statement audit, as well as key terms such as “reasonable assurance” and “due professional care.” The instrument also explains the meaning of an unqualified (“clean”) audit versus an adverse audit opinion for the internal controls over financial reporting as well as the financial statement audits. We used comprehension check questions for each of these concepts to ensure participants understood the overall steps auditors perform in the integrated financial statement audit process and the related auditing terms. Participants were required to answer these comprehension check questions correctly before they could advance to the next stage of the study. Participants who answered incorrectly or failed to respond to these questions were not allowed to continue with the study. This approach ensured that participants understood key auditing concepts that we described in the case before examining the transcript of the legal proceedings.

In Stage Three, participants were randomly assigned to one of four experimental conditions

⁴ Randomization among treatment groups was successful. Untabulated analysis of demographic variables indicate no statistically significant differences between groups for gender, prior jury service, occupation, age, or education.

(described below). Each participant assumed the role of a juror and read the transcript of a hypothetical jury trial related to an audit failure. This hypothetical case is summarized as follows: The hypothetical company, Rapid Shipping, is a publicly traded shipping company for which the audit firm issued an unqualified opinion on the financial statements as well as an ICFR opinion (either clean or adverse). After the issuance of the audit report, a Securities and Exchange Commission investigation suggested that there was a material misstatement of revenue not identified by the auditors. A large pension fund investor (the plaintiff) sues the auditor for negligence alleging that the audit failure was a result of failure to exercise due professional care. The audit firm contends it used an audit testing methodology that conforms to auditing standards and exercised sufficient professional judgment. After reading the trial transcript, participants received jury instructions and responded to dependent, supplemental, and demographic questions.

Independent Variables

Appendix 2 describes the between-subjects manipulations of ICFR opinion (unqualified vs. adverse) and audit methodology (statistical sampling vs. ADA testing). In the ICFR opinion (*OPINION*) condition participants were told that the audit firm issued either an unqualified opinion or an adverse opinion for the audit of internal controls over financial reporting, meaning that the auditors either did not or did identify weaknesses in internal controls related explicitly to internal controls over the revenue recognition processes. We coded *OPINION* as “1” when the auditors issued an adverse ICFR opinion and “0” otherwise. For audit methodology, (*METHOD*) half of the participants learned that the audit firm used audit statistical sampling techniques to examine a portion of the shipping transactions. Other participants learned that the audit firm used data analytics software to examine the entire population of shipping transactions. We coded *METHOD* as “1” when auditors used ADAs and “0” otherwise. In the ADA testing condition, we made clear

that auditors used software to execute audit testing. Further, participants were told that in all conditions, the audit approach enabled a dual-purpose test that allowed the auditors to draw conclusions about both the operating effectiveness of internal controls over shipping transactions and the validity (e.g., occurrence) of recorded sales transactions.

Dependent Variables

Our primary dependent variable was a continuous measure of participants' assessment of auditor negligence (*GUILT*). Participants first indicated whether they believed the auditor was guilty or not guilty (*VERDICT*; coded as "1" for guilty, and "0" for not guilty). Participants who selected "guilty" were then asked to indicate the extent of guilt on an anchored scale where 50% = somewhat completely guilty and 100% = completely guilty. Participants who selected "not guilty" were asked to respond to a corresponding scale where 50% = somewhat completely not guilty and 100% = completely not guilty. Following prior research (e.g., Hoffman et al. 2003; Joe 2003), we recoded and combined the scales to create a continuous guilt measure that ranged from 0% (completely not guilty) to 100% (completely guilty).

Culpable Control Model (the Model) Framework

In the Model, personal control is a latent variable inferred by direct measurement of perceptions of causation, foreseeability, and intentions (Alicke 2000), and we expect this model of blame attribution complements our study. Causation (*Causation*), applied in an auditor litigation context, refers to the extent to which jurors believe that auditors were responsible for the audit failure. When auditors take steps to improve audit quality, such as using higher quality testing methods, it is plausible that jurors will perceive auditors as having less causal control over the audit failure. The litigation setting allows for comparison of perceptions of auditors' use of an expected or standard approach to audit testing (e.g., traditional audit sampling) that is consistent

with auditing standards to an advanced method that is incremental to those expectations. Therefore, it is unlikely jurors differentially evaluate auditors' testing methodologies as they assess causation.

In our context, foreseeability (*Foreseeability*) refers to whether jurors believe the auditor could have expected (*foreseen*) the audit failure. Unlike causation, we expect both the testing methodology and the ICFR opinion to impact jurors' perceptions of foreseeability. Auditors' use of ADAs affects the nature, timing, and extent of testing. Testing the entire population via ADA versus a sample of transactions increases the sufficiency of the audit evidence when including analytics helps to increase the appropriateness of the audit evidence (PCAOB 2010). When auditors issue an adverse ICFR opinion, it suggests to users that the auditor identified material weaknesses in internal controls related to financial reporting. As a result, we expect that use of ADAs will increase jurors' perceptions of the foreseeability of the audit failure. Similar to foreseeability, we also expect that the auditors' testing methodology and the ICFR opinion issued are symbolic of the auditors' intent to conduct a high-quality audit (*Intentions*). We model these relationships in Figure 2 and conduct tests using The Model.

Following Backof (2015), we use a structural equation model to test whether the Model (Alicke 2000) is useful in evaluating how jurors assess auditor negligence in our setting. As indicated in Figure 2, we include both jurors' direct and indirect spontaneous affective reactions to the case. The direct reaction [*DirectReact*] measures jurors' overall feelings about the case. In our study, we calculate *DirectReact* by subtracting participants' feelings toward the plaintiff from their feelings toward the accounting firm such that -9 = Very pro-defendant (auditor) and 9 = Very pro-plaintiff. We ask two questions to derive this measure: "*In your opinion, did the auditor's actions cause the plaintiff's loss?*" where 1 = Not at all caused and 10 = Completely caused; and "*To what extent is the plaintiff responsible for their losses?*" where 1 = Not at all Responsible and

10 = Completely Responsible. The indirect reaction measures jurors' positive or negative assessments of the auditor. To measure indirect reaction, we use an assessment of due professional care [Due Care] as follows: "*Considering the facts of this case, do you agree that a typical auditor who is careful and competent would have made the same judgment as Smith CPAs about Rapid's revenue testing?*" where 1 = strongly disagree and 10 = strongly agree.

As discussed in Section 2, personal control is a latent variable comprised of jurors' assessments of causation, foreseeability, and intent to conduct a high quality audit. We measure each factor on a 10-point Likert-type scale. We measure *Causation* using the following question: "*In your opinion, did the auditor's actions (Smith CPAs) cause the plaintiff's (Bierhoff Pension Fund) loss?*" where 1 = Not at all caused and 10 = Completely caused. We measure *Foreseeability* using the following question: "*In your opinion, was the alleged misstatement of the company's sales revenue foreseeable (by the auditors) given the facts available at the time of the audit?*" where 1 = Not at all foreseeable and 10 = Completely foreseeable. Lastly, we measure *Intention* using the following question: "*Did Smith CPAs (the auditor) intend to conduct a quality audit by using the audit testing approach they used to perform sales revenue testing?*" where 1 = Not at all intended to conduct a high quality audit and 10 = Completely intended to conduct a high quality audit. To derive our *PersonalControl* measure, we use confirmatory factor analysis. We identify only one factor (eigenvalue = 1.79) explaining 69.80% of the variance. Our model has good fit.⁵

We saved the factor scores for each participant and used the score as a covariate in our hypothesis tests. We take this approach to control for jurors' perceptions of auditors' *PersonalControl* which our SEM results and prior literature suggest affect how jurors' assess

⁵Goodness-of-fit (Adj. Goodness-of-fit) = .948 (.920); standardized root mean squared residual (SRMR) = 0.068; root mean square error of approximation (RMSEA = 0.041); comparative fit index (CFI = 0.976); and Tucker-Lewis index (TLI = 0.989) are all within acceptable levels (Hair et al. 2006). *p*-values are one-tailed unless otherwise noted.

auditor negligence. This approach differs from the few prior auditing research studies that use the Model subsequent to Backof (2015). Those studies use one or more of the underlying *PersonalControl* factors rather than the *PersonalControl* factor itself as a mediator between one independent variable of interest and the primary dependent variable. For example, both Vinson, Robertson, and Cockrell (2018) and Gimbar et al. (2016) use only causation and foreseeability in their mediation analyses. We believe that using the *PersonalControl* factor provides a more holistic analysis as we are able to examine interactive effects in the presence of this covariate.

RESULTS

Manipulation Checks

First, we asked participants to recall the auditor's testing methodology. We asked, "*What approach did the auditor use to test sales revenue?*" Of 800 participants meeting the inclusion criteria, 667 (83.38%) answered correctly. Second, we asked participants to recall the auditor's ICFR opinion. We asked, "*What opinion did Smith CPAs (the auditor) assess regarding the effectiveness of Rapid Shipping's Internal Controls over Financial Reporting?*" Of 800 participants, 679 (84.88%) answered correctly.⁶ These percentages indicate successful manipulations for both audit methodology ($\chi^2 = 330.3, p < 0.001$) and ICFR opinion ($\chi^2 = 376.3, p < 0.001$). A total of 761 (95.13%) participants passed at least one, and as previously indicated, 578 (72.25%) passed both manipulation checks. We include all participants in our analyses; however, inferences are qualitatively similar excluding participants who failed manipulation checks. No systematic differences exist along the demographic dimensions or across experimental conditions.

Descriptive Statistics

Table 2 provides descriptive statistics related to participants' assessments of blame

⁶ The failure rate for each manipulation check is comparable to prior research using electronic survey methods (e.g., Andrews et al. 2003; Oppenheimer et al. 2009) and to paper-and-pencil surveys (e.g., Kongsved et al. 2007).

attribution and auditor negligence. Overall, 35.1% of jurors found the auditor guilty, and 64.9% found the auditor not guilty of negligence. Jurors were more likely to find the auditor guilty of negligence when the auditor used traditional sampling techniques *and* issued an unqualified ICFR audit opinion (mean = 42.2%). In contrast, jurors found auditors less negligent when the auditor issued an adverse ICFR audit opinion, regardless of the audit methodology used (mean = 31.8% across *METHOD*). Figure 1 graphically depicts negligence assessments by experimental condition.

[Insert Figure 1 and Table 2 Here]

Evaluation of the Culpable Control Model as an Explanatory Framework

We form no expectations related to *DirectReact* and *DueProfessionalCare*; nonetheless, consistent with Backof (2015) we find a negative relationship between *DueProfessionalCare* and *Causation* ($-0.64, p < 0.001$, two-tailed) and *Foreseeability* ($-0.40, p < 0.001$, two-tailed) and a positive relationship with *Intentions* ($0.53, p < 0.001$, two-tailed). These results suggest that when auditors are perceived to exercise due care, jurors perceive them as less of the cause of the plaintiff's loss and the loss as less foreseeable. Jurors also perceive that the auditor intended to perform a high quality audit. We find a positive relationship between *DirectReact* and *GUILT* ($0.15, p < 0.001$, two-tailed), suggesting that when jurors are pro-plaintiff, they assess auditors as more negligent when there is an audit failure. Consistent with expectations, we find that *Causation* ($0.51, p < 0.001$), *Foreseeability* ($0.91, p < 0.001$), and *Intentions* ($-0.72, p < 0.001$) are significant factors associated with jurors' assessments of auditors' personal control.⁷ Importantly, we find a positive relationship between *PersonalControl* and jurors' evaluations of auditor negligence (*GUILT*) ($0.15, p < .001$). Collectively, these findings suggest the Model is useful in evaluating determinants of juror assessments of auditor negligence, even in a contextually-rich setting.

⁷ We find similar but nuanced results parsing the sample by experimental condition and across independent variables.

Further, these findings extend Alicke (2000) and Backof (2015).

[Insert Figure 2 Here]

Tests of Hypotheses

We tested our hypotheses with an ANCOVA model that uses a continuous measure of auditor negligence (*GUILT*) as the dependent variable, *PersonalControl* as a covariate, and audit testing methodology (*METHOD*) and ICFR opinion (*OPINION*) as independent variables. Table 3 presents the results. Recall that H1 examines whether jurors assess auditors as less negligent when auditors issue an adverse ICFR opinion or more negligent when auditors issue an unqualified ICFR opinion. This prediction suggests a main effect for *OPINION* in our ANCOVA model. Descriptive statistics in Table 2 and Figure 1 show a mean for *GUILT* of 36.54% in the adverse opinion condition and 40.63% in the unqualified opinion condition.⁸ As noted in panel A of Table 3, we find support for H1 as ANCOVA model results show a main effect of *OPINION* on *GUILT* ($F_{1, 795} = 7.11, p = 0.004$).⁹ In untabulated results, we also measure jurors' overall perception of the quality of the auditors' work on a 10-point anchored scale where 1 represents "Lowest Quality Audit Work," and 10 represents "Highest Quality Audit Work." We find that jurors in the adverse ICFR condition perceive audit quality to be higher than those in the unqualified ICFR condition (means = 6.57 vs. 6.18, respectively; $p = 0.006$, one-tailed). These results suggest significantly lower negligence assessments when auditors issue an adverse ICFR opinion and suggest that jurors interpret the ICFR opinion as a signal of financial reporting quality.

[Insert Table 3 Here]

⁸ We report means adjusted for the presence of the *PersonalControl* factor in the ANCOVA model.

⁹ We also 1) test our hypotheses with an ANOVA and 2) use binary logistic regression to examine the main effects of *METHOD* and *OPINION* on the dichotomous dependent variable *VERDICT*, and find qualitatively similar results.

H2 predicts that jurors will assess auditors as more negligent both when they employ traditional sampling versus ADA techniques *and* when they issue an unqualified ICFR opinion. H2 also predicts no differences in negligence assessments when auditors issue an adverse ICFR opinion. Taken together, these predictions describe a disordinal interaction. While we test and find a significant interaction ($F_{1, 795} = 3.88, p = 0.024$) in our ANCOVA model presented in Table 2, we also use contrast analysis to investigate our nuanced predictions in a manner consistent with Guggenmos, Piercey Agoglia (2016). Our contrast tests specifically compare auditor negligence assessments across *METHOD* when *OPINION* is either unqualified or adverse.¹⁰ Consistent with our prediction, panel B of Table 3 shows that jurors assess auditors as significantly more negligent when auditors use traditional sampling versus ADAs and also issue an unqualified ICFR opinion (mean difference = 6.28; $p = 0.030$). We also find, as predicted, no difference in *METHOD* when auditors issue an adverse ICFR opinion (mean difference = -4.94; $p = 0.069$). These results support our hypothesis. Further, we find that when auditors issue an unqualified ICFR opinion, jurors perceive ADA techniques as higher audit quality relative to traditional sampling techniques (means = 7.93 vs. 7.38, respectively; $p = 0.014$, two-tailed; untabulated). However, when auditors issue an adverse ICFR opinion, jurors perceive no difference in audit quality across audit testing methodology (means = 7.73 [ADA] vs. 7.58 [Sampling]; $p = 0.487$, two-tailed; untabulated).

While prior studies investigated the effects of auditors' documentation on jurors' negligence judgments (e.g., Backof 2015), we examine how the ICFR opinion and audit testing methodology affect negligence assessments. Our results are consistent with the literature and provide further evidence that the ICFR opinion is an important signal of potential problems and

¹⁰ Experimental groups tested included: Unqualified-Traditional Sampling (Cell 1); Unqualified-Audit Data Analytics (Cell 2); Adverse-Traditional Sampling (Cell 3); and Adverse-Audit Data Analytics (Cell 4). For H2, we use the following contrasts: Cell 1 > Cell 2: 1, -1, 0, 0 and Cell 3 = Cell 4: 0, 0, 1, -1. All tests use one-tailed p -values.

the overall quality of the financial reporting (e.g., Ashbaugh-Skaife et al. 2009). However, we demonstrate that this perception of quality is more pronounced *when* the auditor fails to signal a potential misstatement. Further, we find that jurors anchor on their perception of the public signal sent by the ICFR opinion and the type of opinion then informs how the auditor's testing methodology affects jurors' assessments of auditor negligence.

Additional Analyses

Blame Attribution

To investigate further our primary results, we examine the extent of blame jurors attribute to auditors, management, and the plaintiff after an audit failure. We use the Preacher and Hayes (2008) multiple mediator model to determine the effect of *OPINION* on *GUILT* through three measures of *BlameAttribution* (auditor, management, and plaintiff; see Figure 3). To derive *BlameAttribution*, we asked jurors to indicate each party's responsibility for the plaintiff's loss on a 10-point scale anchored on 1 (*Not at all responsible*) and 10 (*Completely responsible*).¹¹ Using all three measures in our mediation analysis allows us to determine the effect of each measure while controlling for the other two measures in the model.

As noted in Figure 2, the results of the mediation analysis indicate that the effect of *OPINION* on *GUILT* is mediated by all three of our measures of *BlameAttribution*.¹² The direct effect of *OPINION* on *Blame Auditor* is negative and significant ($b = -0.58$; $t_{798} = -3.23$; $p = 0.001$). This suggests, consistent with our primary analyses, that when auditors issue an adverse ICFR opinion, jurors assess them as less to blame for a subsequent audit failure. Also consistent with the Model and our earlier suppositions, we find that jurors assess both management and the investor (Plaintiff) as more to blame for the subsequent audit failure when the auditor issues an adverse

¹¹ The *Blame Auditor* scale differs in that it is anchored on 1 (*Not at all caused*) and 10 (*Completely caused*).

¹² Statistical inferences are unchanged when we use our binary measure of guilt (*VERDICT*).

ICFR. Specifically, we find that the direct effect of *OPINION* on *Blame Management* is positive and significant ($b = 0.29$; $t_{798} = 1.84$; $p = 0.066$)¹³ and the effect of *OPINION* on *Blame Plaintiff* is positive and significant ($b = 0.64$; $t_{798} = 3.53$; $p < 0.001$). We also find that the direct effect of each of our *BlameAttribution* measures on *GUILT* is significant. Figure 2 shows that the effect is positive and significant for *Blame Auditor* ($b = 8.74$; $t_{795} = 25.16$; $p < 0.001$), but negative and significant for both *Blame Management* ($b = -1.42$; $t_{795} = -3.82$; $p = 0.001$) and *Blame Plaintiff* ($b = -1.24$; $t_{795} = -3.66$; $p = 0.003$). Next, we find that the indirect effect of *OPINION* through each of our *BlameAttribution* measures on *GUILT* is significant.¹⁴ The effect through *Blame Auditor* (indirect effect = -5.05; lower CI = -8.06; upper CI = -1.93), *Blame Management* (indirect effect = -0.42; lower CI = -1.08; upper CI = -0.02) and *Blame Plaintiff* (indirect effect = -0.79; lower CI = -1.60; upper CI = -0.31) each is negative and significant. Lastly, The direct effect of *OPINION* on *GUILT* ($b = 1.14$; $t_{795} = 0.70$; $p = 0.481$) was no longer significant in the presence of the collective *BlameAttribution* mediators, which suggests that how jurors attribute blame mediates the effect of an adverse ICFR opinion on jurors' assessments of auditor negligence.

Our collective findings extend prior research and provide evidence that jurors' ascription of blame to different constituents in the audit process influences their negligence assessments. Primarily, jurors perceive an adverse ICFR opinion as a warning from auditors to financial statement users about the quality of the financial reports. Investors, in turn, should consider this signal when making investment decisions. Because an adverse ICFR opinion is a public signal about the potential for financial reporting related issues, jurors believe the plaintiff shares some

¹³ Our mediation tests using the PROCESS Macro present two-tailed p -values. However, we make directional predictions, which suggest this result would be significant at the $p < .05$ level using the one-tailed p -value of 0.033.

¹⁴ Sobel's tests are significant for judgments of the probability of negligence for *Blame Auditor* ($z = -3.20$, $p = 0.001$), *Blame Management* ($z = -2.17$, $p = 0.031$), and *Blame Plaintiff* ($z = -2.49$, $p = 0.013$).

responsibility for the loss incurred, and this shared responsibility abates jurors' assessment of auditor negligence.

[Insert Figure 3 Here]

In untabulated results, we also parse our overall mediation analyses by audit testing methodology to determine whether, like our ANCOVA results for the interaction (HYPOTHESIS 2), the results are driven by auditors' use of traditional statistical sampling relative to ADAs. For traditional sampling, we find similar and, in some instances, stronger results than our overall mediation analysis. In particular, we find that the effect of *OPINION* on *GUILT* is mediated by each of our measures of *BlameAttribution* such that the direct effect of *OPINION* on *GUILT* is insignificant conditional on measures of *BlameAttribution* ($p = .314$). Conversely, when we focus on when auditors use ADAs, the direct effect of *OPINION* on *GUILT* conditional on measures of *BlameAttribution* is insignificant ($p = .871$); thus mediation analysis is inappropriate in that setting. These results suggest when the auditor uses ADAs, the type of ICFR opinion has no differential effect on auditor negligence, though when auditors employ techniques perceived to increase the likelihood of detecting misstatements, jurors perceive incrementally higher audit quality.

Perceptions of Assurance

To further investigate our results, we examine whether jurors perceive that auditors provide relatively more assurance when they employ ADAs versus traditional sampling. We assess jurors' perceptions of assurance that: 1) internal controls are operating effectively¹⁵, and 2) the financial statements are free from material misstatement.¹⁶ Related to internal controls, we find no

¹⁵ Participants responded to the question "What level of assurance that internal controls are operating effectively do you think Smith CPAs actually provided?" on a scale ranging from 1(*No Assurance*) to 10 (*Absolute Assurance*).

¹⁶ Participants responded to the question "What level of assurance that the financial statements are free of material misstatement do you think Smith CPAs actually provided?" on a scale ranging from 1(*No Assurance*) to 10 (*Absolute Assurance*), emphasis included in the original instrument provided to participants.

difference in juror perceptions of assurance when the auditor uses ADAs versus traditional statistical sampling audit testing procedures (means = 6.05 vs. 5.79, respectively; $p = 0.136$, two-tailed; untabulated). Related to misstatements in the financial statements, we also find that jurors perceive no difference in assurance when the auditor uses ADAs versus traditional statistical sampling audit testing procedures (means = 5.84 vs. 5.77, respectively; $p = 0.419$, two-tailed; untabulated). Coupled with our prior audit quality findings, these assurance-related findings suggest that jurors agree with auditors' contention that ADAs improve audit quality but may provide no greater than reasonable assurance which is similarly assumed by non-ADA techniques.

CONCLUSION

In this study, we examine whether and to what extent the ICFR opinion contextualizes jurors' perception of audit methodology quality (i.e., employing audit data analytics [ADA] or traditional sampling) as they assess auditor negligence after an audit failure. We develop our predictions using an adaptation of the Culpable Control Model (Alicke 2000), which is a useful framework for evaluating the process of assessing blame. To test our expectations, we conducted a 2x2 between-subjects full factorial experiment where we manipulated the auditor's testing methodology (ADA versus traditional sampling) and the ICFR opinion issued (unqualified versus adverse). Our participants were jury-eligible persons, and we note four main findings. First and consistent with prior applications of the Model in accounting (e.g., Vinson et al. 2018; Gimbar et al. 2016; Backof 2015), we find an overall positive relationship between jurors' perceptions of auditors' personal control in relation to the audit failure and their assessment of auditor negligence. Second, we find that the ICFR opinion directly affects how jurors assess negligence and suggest that adverse opinions provide a signal to financial statement users of the potential for financial reporting related issues. These adverse opinions result in lower perceptions of auditor negligence.

Further, we find that when auditors issue an unqualified ICFR opinion, a lack of a salient signal of otherwise problematic or questionable financial reporting quality, jurors make higher negligence assessments when auditors employ traditional statistical sampling techniques than when they employ ADA techniques. Lastly, mediation analysis indicates that the effects of the ICFR opinion on jurors' assessment of auditor negligence are explained by jurors' attribution of blame among auditors, management, and the investors (i.e., the plaintiff) who incur a loss by relying on the financial statements. We find that when auditors issue an adverse ICFR opinion, jurors attribute less blame to auditors—and more blame to management and the investor—for the audit failure and the resulting financial loss thereby assessing auditors as less guilty of negligence.

Our study is one of the first to directly examine when the use of more advanced audit methodologies that utilize technology enhances jurors' perceptions of audit quality and assurance. Proponents contend that the use of ADAs will not only enhance audit effectiveness and efficiency but will also result in reduced audit risk and liability because auditors will be able to achieve a higher level of assurance. Our results suggest that jurors indeed perceive higher audit quality when auditors use ADAs, relative to traditional sampling in a clean ICFR opinion context. Also, we do not find differences in jurors' perception of financial statement assurance when auditors use ADAs versus traditional sampling to evaluate audit evidence. This study has implications for regulators interested in additional audit quality indicators and factors to consider if auditing standards require revision to encourage or support auditors' leveraging of technology to enhance the efficiency and effectiveness of the audit. Our study has implications for practitioners interested in or using ADA techniques in the audit process, despite audit practitioners' assertions that the use of these techniques will not affect financial statement users' perceptions of audit quality.

Our study also contributes to the auditing literature regarding the effects of ICFR opinion disclosure as well as factors that affect jurors' negligence judgments. In line with what Hammersley et al. (2008) find regarding the affect disclosure of ICFR opinions have on stock prices, we find that the disclosure of ICFR opinions provide a context within which jurors differentially attribute blame for an audit failure, interpret auditors' efforts to improve audit quality, and influence jurors' negligence decisions. Our study also provides avenues for future research on the effects of audit testing disclosure and complements prior and contemporaneous research on the use of technology to enhance the audit process (e.g., Brown-Liburd et al. 2015; Barr-Pulliam 2018; Rose et al. 2017; Rose et al. 2019). Lastly, our study supports the supposition in Bakckof (2015) and subsequent research by Vinson et al. (2018) and Gimbar et al. (2016) that the Culpable Control Model (Alicke 2000) is a useful framework for examining factors that influence perceptions of auditor negligence in contextually-rich settings.

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Table 1: Participant Demographics

Variable	N	Percentage or Mean (S.D.)
Prior jury service		
Yes	93	11.6%
No	707	88.4%
Prior experience		
Lawyer	20	2.5%
Investor	186	23.3%
None	594	74.3%
Gender		
Female	464	58.0%
Male	333	41.6%
Self-Identified as Other	3	0.4%
Age	800	37.1 (12.2)
Education		
Graduate	118	14.8%
Undergraduate	424	53.0%
Trade School	111	13.9%
High School	147	18.4%
Number of Accounting Courses	800	1.0 to 2.0 courses (.00)
Number of Finance Courses	800	1.0 to 2.0 courses (.33)

Table 2: Descriptive Statistics*

		<u>Variable</u>	<u>Audit Methodology</u>		<u>Total</u>
			<u>Statistical Sampling</u>	<u>Audit Data Analytics</u>	
ICFR Audit Opinion	<u>Unqualified</u>	Guilty	N = 84 (41.6 %)	N = 68 (34.3%)	N = 152 (38.0%)
		Not Guilty	N = 118 (58.4%)	N = 130 (65.7%)	N = 248 (62.0%)
		Extent of Guilt	N = 202 42.78 (34.0)	N = 198 38.48 (32.4)	N = 400 40.63 (33.4)
	<u>Adverse</u>	Guilty	N = 59 (29.4%)	N = 68 (34.2%)	N = 127 (31.8%)
		Not Guilty	N = 142 (70.6%)	N = 131 (65.8%)	N = 273 (68.2%)
		Extent of Guilt	N = 201 35.66 (31.8)	N = 199 37.42 (34.7)	N = 400 36.54 (33.3)
<u>Total</u>		Guilty	N = 143 (35.5%)	N = 136 (34.3%)	N = 279 (34.9%)
		Not Guilty	N = 260 (64.5%)	N = 261 (65.7%)	N = 521 (65.1%)
		Extent of Guilt	N = 403 39.22 (33.3)	N = 397 37.95 (33.5)	N = 800 38.58 (33.4)

Verdict is a binary measure where Not Guilty = 0 and Guilty = 1. Percentage of total participants in the cell in parentheses.

Extent of Guilt is a continuous measure of jurors' perception of auditor negligence where 0% (100%) = completely not guilty (guilty); Mean (Standard deviation).

*Because we use an ANCOVA model in Table 3 to test our hypotheses, we report means for *Extent of Guilt* adjusted for the presence of *PersonalControl* in the model.

Table 3: Tests of Hypotheses**Panel A: ANCOVA of Jurors Perception of Auditor Extent of Guilt ($N = 800$)^a**

	df	SS	F	p-value
OPINION (<i>H1</i>)	1	3351.47	7.11	.004
METHOD	1	322.48	0.69	.204
METHOD x OPINION (<i>H2</i>)	1	1827.08	3.88	.024
<i>PersonalControl</i>	1	504943.34	1071.86	< .001
Between-subjects error	795	374518.19		

^a*Dependent Variable (Extent of Guilt)* is a continuous measure of jurors' perception of auditor negligence where 0% (100%) = completely not guilty (guilty). *METHOD* = Manipulated between-subjects as traditional sampling (0) vs. audit data analytics (1). *OPINION* = Manipulated between-subjects as an unqualified (0) vs. adverse (1) internal control over financial reporting opinion. Traditional sampling vs. audit data analytics. *PersonalControl* is a covariate in our model. The factor includes jurors' assessments of whether auditors caused the loss to the investor (causation), foreseeability of the loss, and the auditor's intent to conduct a high quality audit. One-tailed p-values.

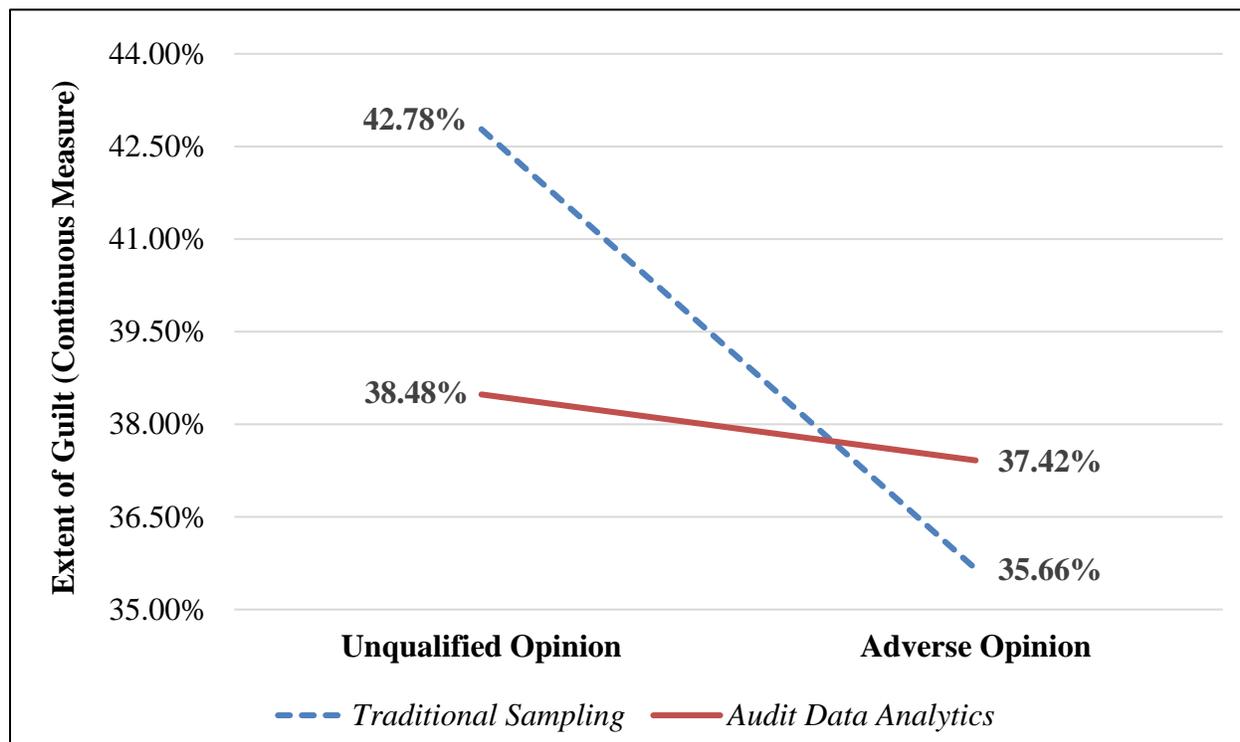
Panel B: Simple Effects Planned Contrast Tests of H2

Comparison	Contrasts	Mean Difference	Std. Error	t-Stat	p-value*
Cell 1 > Cell 2 (<i>H2</i>)	1 -1 0 0	6.28	3.32	1.89	0.030
Cell 3 = Cell 4 (<i>H2</i>)	0 0 1 -1	4.94	3.32	1.49	0.069
Cell 1 > Cells (2, 3, 4)/3	3 -1 -1 -1	22.68	8.12	2.80	0.005

Dependent Variable (Extent of Guilt) is a continuous measure of jurors' perception of auditor negligence where 0% (100%) = completely not guilty (guilty). 2 (*OPINION*) x 2 (*METHOD*) factorial experimental groups tested include: Unqualified-Traditional Sampling (Cell 1); Unqualified-Audit Data Analytics (Cell 2); Adverse-Traditional Sampling (Cell 3); and Adverse-Audit Data Analytics (Cell 4).

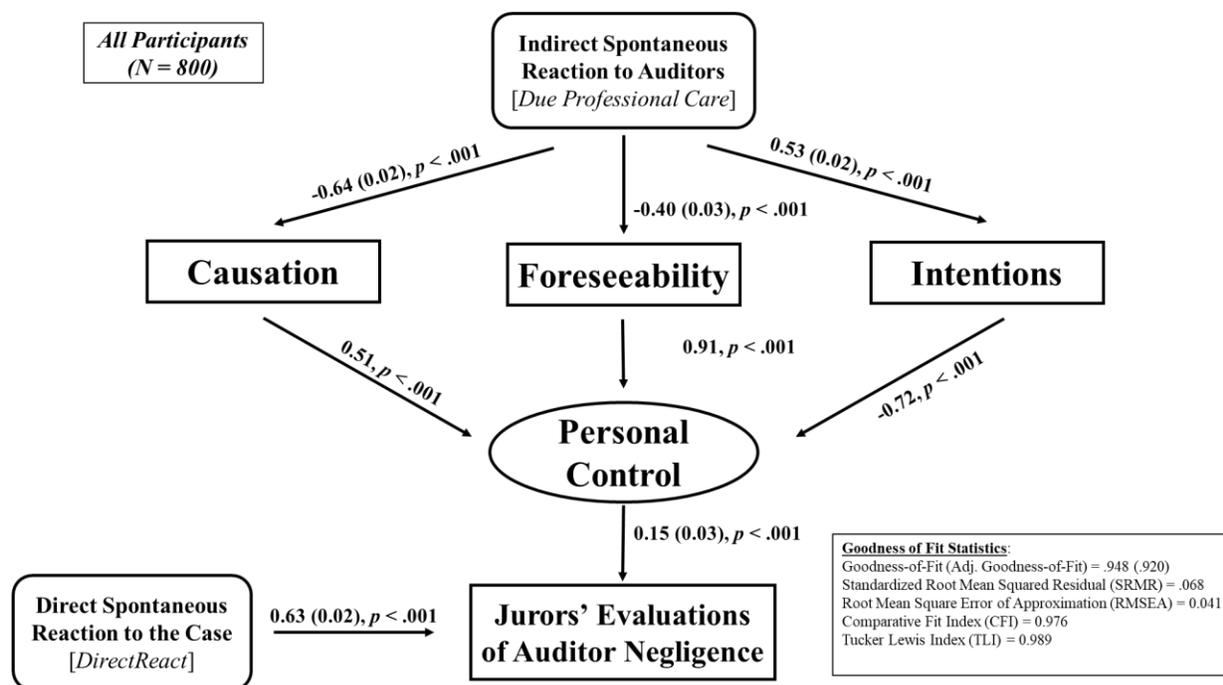
*One-tailed p-values; equal variances not assumed.

Figure 1: Interactive Effects of Audit Opinion and Audit Methodology



Dependent Variable (Extent of Guilt) is a continuous measure of jurors' perception of auditor negligence where 0% (100%) = completely not guilty (guilty). *OPINION* = Manipulated between-subjects as an unqualified (0) vs. adverse (1) internal control over financial reporting opinion. *METHOD* = Manipulated between-subjects as traditional sampling (0) vs. audit data analytics (1). Because we use an ANCOVA model in Table 3 to test our hypotheses, we report means for *Extent of Guilt* adjusted for presence of *PersonalControl* in the model.

FIGURE 2: Test of Model of Jurors' Evaluations of Auditor Negligence
(adapted from Alicke 2000 & Backof 2015)



This figure shows the results of the structural equation model. Standardized factor loadings and corresponding p -values (one-tailed) are shown on the links between causation, foreseeability, and intention and auditors' personal control. All other numbers are unstandardized path coefficients and corresponding p -values (all one-tailed).

Indirect Spontaneous Reaction to the Auditors [Due Professional Care] measured as follows:

"Considering the facts of this case, do you agree that a typical auditor who is careful and competent would have made the same judgment as Smith CPAs about Rapid's revenue testing?" (1 = strongly disagree; 10 = strongly agree)

Causation measured as follows:

"In your opinion, did the auditor's actions (Smith CPAs) cause the plaintiff's (Bierhoff Pension Fund) loss?" (1 = Not at all caused, 10 = Completely caused)

Foreseeability measured as follows:

"In your opinion, was the alleged misstatement of the company's sales revenue foreseeable (by the auditors) given the facts available at the time of the audit?" (1 = Not at all foreseeable, 10 = Completely foreseeable)

Intention measured as follows:

"Did Smith CPAs (the auditor) intend to conduct a quality audit by using the audit testing approach they used to perform sales revenue testing?" (1 = Not at all intended to conduct a high quality audit; 10 = Completely intended to conduct a high quality audit)

Direct Spontaneous Reaction to the Case [DirectReact] is calculated by subtracting participants' feelings toward the plaintiff from their feelings toward the accounting firm such that -10 = Very pro-defendant (auditor) and 10 = Very pro-plaintiff. The questions used to calculate *DirectReact* were presented to participants as follows:

"In your opinion, did the auditor's actions cause the plaintiff's loss?" (1 = Not at all caused, 10 = Completely caused)

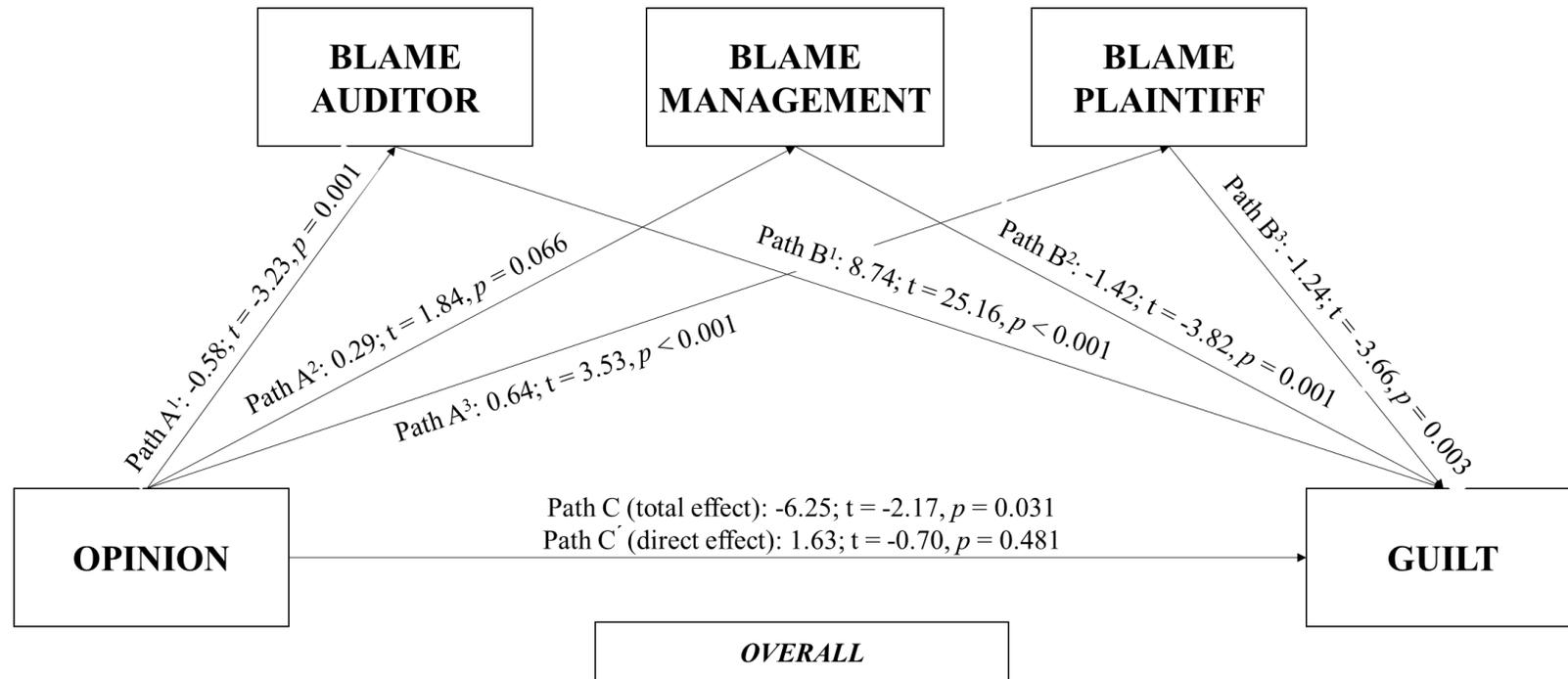
"To what extent is the plaintiff responsible for their losses?" (1 = Not at all Responsible, 10 = Completely Responsible)

Jurors' Evaluations of Auditor Negligence [Guilt] refers to the jurors' assessments of the auditor negligence using a continuous measure of guilt on a scale ranging from 0% (completely not guilty) to 100% (completely guilty).

Table 4: Descriptive Statistics – By Blame Attribution

Blame Attribution	Independent Variables	Mean	Std. Deviation	
BLAME AUDITOR <i>Did the auditor's action cause the plaintiff's loss? (1 = Not at all Caused, 10 = Completely Caused)</i>	Clean Opinion	Traditional Sampling	4.88	2.547
		Data Analytics	4.85	2.443
		Total	4.86	2.493
	Adverse Opinion	Traditional Sampling	4.08	2.504
		Data Analytics	4.49	2.607
		Total	4.29	2.560
	Total	Traditional Sampling	4.48	2.553
		Data Analytics	4.67	2.530
		Total	4.57	2.542
BLAME MANAGEMENT <i>Extent management is responsible for the misstatement (1 = Not at all Responsible, 10 = Completely Responsible)</i>	Clean Opinion	Traditional Sampling	6.73	2.243
		Data Analytics	7.00	2.020
		Total	6.87	2.137
	Adverse Opinion	Traditional Sampling	7.24	2.339
		Data Analytics	7.08	2.365
		Total	7.16	2.351
	Total	Traditional Sampling	6.99	2.303
		Data Analytics	7.04	2.198
		Total	7.01	2.250
BLAME PLAINTIFF <i>Extent plaintiff is responsible for their losses (1 = Not at all Responsible, 10 = Completely Responsible)</i>	Clean Opinion	Traditional Sampling	4.95	2.491
		Data Analytics	5.05	2.392
		Total	5.00	2.440
	Adverse Opinion	Traditional Sampling	5.67	2.591
		Data Analytics	5.60	2.691
		Total	5.64	2.638
	Total	Traditional Sampling	5.31	2.564
		Data Analytics	5.32	2.558
		Total	5.32	2.559

Figure 3: Results of Mediation Analysis for Blame Attribution



Standardized Coefficients; t -statistics and p -values (two-tailed) shown for each path. We use the Hayes (2012) PROCESS Model #4 in SPSS.

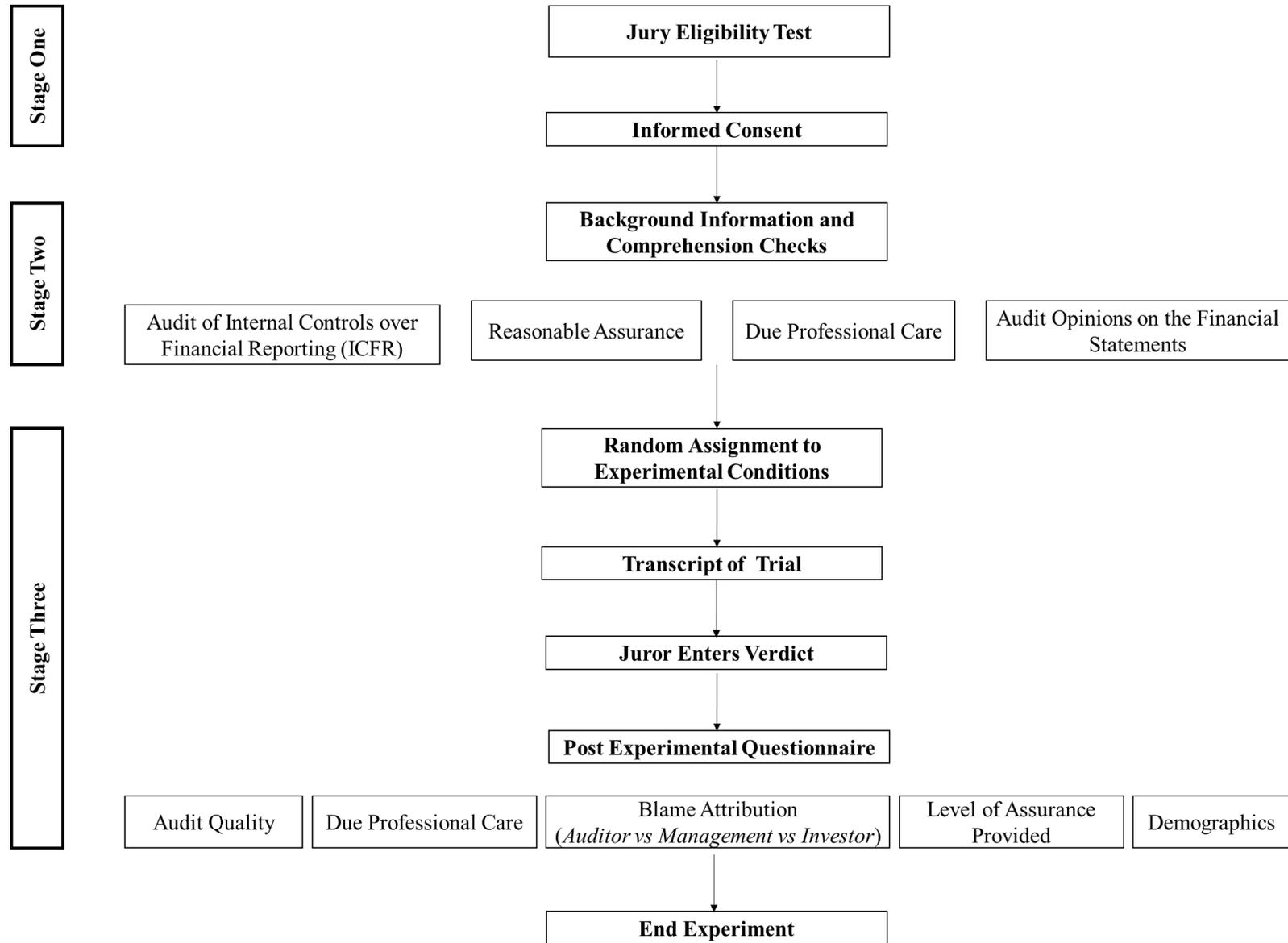
OPINION = ICFR audit opinion issued (0=Unqualified, 1=Adverse)

GUILT = Jurors assessment of auditor negligence ranging from 0% (Completely not guilty) to 100% (Completely guilty)

BLAME VARIABLES: All measured on a 10-point scale anchored on 1 (*Not at all responsible*) and 10 (*Completely responsible*) [Means in Table 4]

- *BLAME AUDITOR* = “In your opinion, did the auditor’s actions (Smith CPAs) cause the plaintiff’s (Bierhoff Pension Fund) loss?”
- *BLAME MANAGEMENT* = “In your opinion, to what extent is management of Rapid Shipping (the company) responsible for the subsequent misstatement in sales revenue?”
- *BLAME PLAINTIFF* = “In your opinion, to what extent is Bierhoff Pension Fund (the plaintiff) responsible for the losses that they suffered?”

Appendix 1: Flow the Experiment



Appendix 2: Manipulation of Independent Variables

Audit Methodology (METHOD)

Statistical Sampling Techniques Manipulation:

To test Rapid's revenue account balance, Smith CPAs *used audit statistical sampling techniques to examine a portion (i.e., less than 100%)* of transactions from the entire population of Rapid's 2013 shipping transactions. This audit approach allows Smith CPAs to draw conclusions, *based on the analysis of the sample*, about the effectiveness of internal controls over Rapid's 2013 shipping transactions. *For the sample of shipping transactions selected*, Smith CPAs performed cutoff tests to identify shipping orders placed before or after the 2013 yearend. To ensure these were valid revenue transactions, Smith CPAs validated that each transaction from *the sample* received the required minimum number of scans. This ensures that automatically generated revenue entries in the accounting system actually occurred and were complete.

Audit Data Analytic Techniques Manipulation:

To test Rapid's revenue account balance, Smith CPAs *used audit data analytics software techniques to electronically examine the entire population (i.e., 100%)* of Rapid's 2013 shipping transactions. This audit approach allows Smith CPAs to draw conclusions, *based on the analysis of the entire population*, about the effectiveness of internal controls over Rapid's 2013 shipping transactions. *For the entire population of shipping transactions*, Smith CPAs performed cutoff tests to identify shipping orders placed before or after the 2013 yearend. To ensure these were valid revenue transactions, Smith CPAs validated that each transaction from *the entire population* received the required minimum number of scans. This ensures that automatically generated revenue entries in the accounting system actually occurred and were complete.

ICFR Audit Opinion (OPINION):

Unqualified Opinion Manipulation:

Smith CPAs **did not detect** material weaknesses in internal controls related to revenue recognition. Since their opinion about internal controls influences the level of audit testing they perform on revenue recorded in the financial statements, they were negligent because they did not execute an appropriate level of testing of the amount Rapid recorded in the financial statements. Consequently, they did not detect the material revenue misstatement when they audited Rapid's financial statements. Therefore, they are directly to blame.

Adverse Opinion Manipulation:

Smith CPAs **detected** material weaknesses in internal controls related to revenue recognition. Since their opinion about internal controls influences the level of testing they perform on revenue recorded in the financial statements, they were negligent because they did not execute an appropriate level of testing of the amount Rapid recorded in the financial statements. Consequently, they did not detect the material revenue misstatement when they audited Rapid's financial statements. Therefore, they are directly to blame.