A POST-SARBANES-OXLEY IMPLEMENTATION EVALUATION OF INTERNAL CONTROL EFFECTIVENESS JUDGMENTS

Suzanne Marie Seymoure

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Larry N. Killough (Chair)
Sheryl B. Ball
Robert M. Brown
John A. Brozovsky
James G. Jenkins

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(ABSTRACT)

This study explores the relationship between an individual's current professional occupation and the effect of the order of information on their evaluation when making internal control effectiveness judgments. The Sarbanes-Oxley Act (SOX) requires a new mindset for individuals that have responsibility for the internal controls in place at an organization. SOX requires both auditors and management to evaluate the effectiveness of the internal controls over financial reporting. Prior to the implementation of SOX, auditors were required to evaluate internal controls and their effect on the reliability of the financial statements; however, neither group was required to provide an opinion to the public regarding the findings of the evaluation.

This study utilizes a within- and between-subjects research design, using the subjects' occupation (auditor or management) as one independent variable, and manipulating the order in which the cases are received by the subjects for the second independent variable. For each case, the subjects were provided three internal control judgments: effectiveness and efficiency of operations, reliability of financial reporting, and Sarbanes-Oxley required internal control effectiveness judgment. Additionally, subjects indicated their reliance on each of the internal control effectiveness cues included by allocating 100-points among each of the six cues included in the instrument.

Based on the results of the current study, auditors and management did not provide different judgments. Additional analyses were conducted to explore whether experience impacts the self-insight individuals have into their reliance on cues when providing judgments. Findings did not indicate that subjects with greater experience were more likely to have greater insight into their reliance on information.

The findings suggest that neither role nor case ordering affected the subjects' professional judgment. Overall, auditors and management did not provide statistically significant different judgments in relation to Sarbanes-Oxley judgments. The similarity in judgments should provide some reassurance to auditors and investors that given no guidance but the same information for judgments, management and auditors will come to similar conclusions regarding the effectiveness of internal controls over financial reporting.

DEDICATION

This dissertation is dedicated to my parents, Roger and Connie Seymoure. Without their continued love, support, and encouragement, this would not have been possible. They have been my editors and support system through this entire process. Their confidence in my abilities has always been a driving force in my completing whatever task was at hand. Thank you for everything you have done for me.

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CHAPTER 1
INTRODUCTION

Prior to the enactment of the Sarbanes-Oxley Act (SOX), auditors' primary concern surrounding the effectiveness of internal controls was in preventing or detecting misstatements in the financial statements. However, accounting scandals involving Enron and WorldCom have resulted in greater scrutiny and regulation of organizations' internal controls. Investor confidence in the reliability of financial reporting has decreased with the increasing number of accounting scandals (Coffin 2002). To combat this loss in confidence, the Sarbanes-Oxley Act was implemented with the intention of focusing auditors' and management's attention on the effectiveness and understanding of the internal control structure in place at an organization (Jain and Rezaee 2006). Section 404 of SOX requires top executives to obtain an understanding of a company's internal controls by documenting and testing them. This is necessary for management to attest to the effectiveness of their company's internal controls over financial reporting (ICFR). Starting with fiscal year-ends on or after June 15, 2004, management is required to attest to the effectiveness of ICFR and disclose their findings of any material weaknesses.

The Public Company Accounting Oversight Board (PCAOB) implemented Audit Standard No. 2 (AS2) to assist auditors in the execution of the requirements of Section 404 in SOX. With the implementation of AS2, auditors were required to approach their internal control effectiveness evaluations from a top-down risk approach

and focus on those elements of internal control at the company level[1] before focusing on the financial statement level controls (O'Brien 2006). However, when the PCAOB evaluated the work that had been done to implement the requirements of AS2 and SOX, they found the cost to companies and the effort exerted to be greater than anticipated (PCAOB 2007a). In response to these audit inefficiencies, the PCAOB developed a new standard, Audit Standard No. 5 (AS5). The purpose of AS5 is to focus the auditors' procedures to conduct a more effective and efficient ICFR and financial statement audit (PCAOB 2007b). Several significant changes occurred when AS5 was implemented. Under AS2, auditors provided two internal control judgments, the first being the auditor's assessment of the effectiveness of ICFR and the second focusing on management's assessment of ICFR. Audit Standard 5 (AS5) requires auditors to only provide the first of those two judgments. A second significant change from AS2 allows auditors to incorporate the knowledge they gained in the prior year's audit into the current year audit. Additionally, AS5 allows auditors to rely on the work of others[2] to a greater degree, potentially creating a more efficient audit. By allowing auditors to rely on the

[1] "Company-level controls include the following: controls within the control environment, such as tone at the top, organizational structure, commitment to competence, and human resource policies and procedures; management's risk assessment process; centralized processing and controls, such as shared service environments; controls to monitor other controls, including activities of the internal audit function, the audit committee, and self-assessment programs; and the end-of-period financial reporting process." (O'Brien 2006, p. 37) Tone at the top refers to the moral atmosphere top leadership has established within the organization.

[2] AS5 encourages auditors to utilize the work of others to reduce their work. Others as defined by the PCAOB may include "internal auditors, company personnel (other than internal auditors), or third parties working under the direction of management or the audit committee (PCAOB 2007, pA1-10)." The auditors should assess the competence and objectivity of the individual before relying on their work.

work of others and carry over knowledge gained in prior years, auditors have the ability to focus on areas that may be of higher risk. Auditors are encouraged to integrate their fraud risk assessment, necessary for the financial statement audit, into their evaluation of ICFR. These changes should facilitate the auditors refocusing their audit planning on those areas that are higher risk and less on the tedium that the auditors were concentrating on when SOX and AS2 were first implemented.

The purpose of this study is to explore if auditors and management make similar judgments regarding ICFR when identical information is available during their decision process. This study seeks to understand whether auditors and management make similar judgments and whether the increased reliance by auditors on the work of others is appropriate in the internal control effectiveness judgments. Additionally, the study explores whether the order the cases are received by subjects impacts their judgments. With the decreasing time frame auditors and management have to complete the financial statement and ICFR audit, it is necessary to understand whether the order cases were received and evaluated impacts the decisions that are made. The order variable was introduced to represent the potential impact to auditors' or management's judgment when they have been reviewing multiple areas' or companies' internal controls over a relatively short span of time.

Specifically, this study examines auditor and management internal control judgments to investigate if the two groups evaluate internal controls similarly. In addition to overall judgments, the reliance on specific cues and recency effects is explored. Auditors are facing greater pressure to complete their audits of public

companies. One source of pressure may be the public's increased awareness and scrutiny of corporate decisions, as seen in the growing interest in how companies are managing their portions of the government bailout (Fitzpatrick and Craig 2009; Parloff 2009). In addition to an increased public awareness of corporate decisions, auditors and management face a decreased time frame for filing audited financial statements with the Securities and Exchange Commission (SEC) for large accelerated filers (SEC 2005). This results in the review of more financial statements and internal control processes by auditors in a shorter period of time.

Research (Ashton 1974a; Ashton and Kramer 1980) similar to the current study found that manipulating the order of the internal control effectiveness judgment cases received by the subjects impacted the subjects' reliance on specific cues. The order impact on judgments supports the possibility of a recency effect based on the case ordering subjects receive. Recency (Anderson and Maletta 1999; Asare 1992; Ashton and Kennedy 2002; Cuccia and McGill 2000; Favere-Marchesi 2006; Green 2004; Guiral-Contreras et al. 2007; Jensen et al. 1996; LaSalle 1997; Messier 1992; Messier and Tubbs 1994; Monroe and Ng 2000; Trotman and Wright 1996) and primacy (Anderson and Maletta 1999; LaSalle 1997) have been investigated in prior accounting literature. Accounting research has typically found that accountants are subject to recency more often than primacy. The recency effect could be representative of the practice of auditors and managers evaluating multiple internal control processes or clients in a short period of time and carrying over beliefs from prior evaluations to the current evaluation. Recency findings in auditors' judgments could potentially lead to ineffective

audits if auditors are carrying over beliefs/findings from prior audits to their current client. Additionally, if management is carrying over findings from the analysis of one account to another, this may lead to an incorrect overall assessment by the organization. Regardless of whether primacy or recency exists in auditors' or management's internal control effectiveness judgments, order effects could lead to an ineffective[3] opinion on the effectiveness of ICFR.

With the implementation of SOX in 2004, research is beginning to examine the effects of revealing the existence of an internal control deficiency in a company's internal controls. American International Group, Inc. (AIG) was forced to write-down their credit portfolios by auditors due to a flawed valuation. In the course of the annual audit, material weaknesses were discovered in AIG's internal controls (Beck 2008). While AIG's auditors released their findings that material weaknesses existed in AIG's ICFR, AIG insisted that compensating controls existed to alleviate their investors' concerns surrounding the reliability of ICFR. The events at AIG imply there is an increased need for understanding of the internal control effectiveness judgment process from both the management and auditor perspectives. The findings from this study support the belief that auditors and management make similar judgments when provided with identical information to judge the effectiveness of the internal controls in place within an organization.

[3] An ineffective audit would indicate that auditors provided the wrong opinion. For example, the auditors determined that the internal controls were effective and issued a clean opinion, when in fact the internal control was not effective and should have been given an adverse opinion due to material weaknesses existing in the ICFR.

The current study's findings did not indicate that subjects are susceptible to recency effects when provided with a relatively large number of judgments over a short period of time. Overall, the subjects did not provide statistically different internal control effectiveness judgments. Subjects' reliance on specific cues did not differ significantly between auditors and management. When self-insight was explored, no significant differences were found when controlling for varying experience levels.

The remainder of this study is organized as follows: Chapter 2 investigates the findings in prior research and the hypotheses and research question tested, Chapter 3 discusses the methodology that was employed in the study, Chapter 4 examines the findings from the study, and Chapter 5 concludes with the discussion of implications and limitations of the study.

CHAPTER 2
LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

This chapter discusses literature relevant to the current study. The first section explores the internal control judgment literature leading to the first hypothesis. The second section investigates recency effects and the mitigating factors related to the second hypothesis. The third section looks at cue reliance as related to internal control judgment tasks leading to two related hypotheses. The final section investigates potential impacts on the judgments of auditors and managers and proposes a research question regarding the differences in internal control effectiveness judgments provided by auditors and management.

2.1 Internal Control Judgments

Prior to the implementation of SOX, the internal control context was often used to understand auditors' judgment and decision-making processes, as well as the effects of other factors (e.g., experience) on auditors' decision-making. For example, Ashton (1973) used an internal control context to examine judgment consistency, using an instrument with six internal control effectiveness cues. Those six cues were used to create 32 unique cases which were used by the subjects to evaluate the effectiveness of the internal controls in place at the organization. The highly subjective nature of judgments caused Ashton to believe they would be inconsistent over time. He operationalized consistency using two methods, consensus between auditors and consensus over time within the same auditor group.

The instrument created by Ashton (1973) has been replicated and adapted several times to gain a better understanding of subjects' internal control judgments. Trotman et al. (1983) modified Ashton's (Ashton 1973, 1974a, 1974b; Ashton and Kramer 1980) instrument to examine the effect of individual and group dynamics on students' internal control judgments. For individual decision making, Trotman et al. (1983) found lower correlations (0.56) between auditors than did Ashton (1973, 1974a, 1974b) and Ashton and Kramer (1980), 0.70 and 0.66 respectively. Trotman et al. (1983) suggested that the difference might be due to their use of student subjects and the increase in the number of cues included in the instrument.

Conflicting evidence exists regarding experience's impact on consensus between different groups of subjects. Ashton and Kramer (1980) found that although auditor and student judgments were similar, auditors' judgments exhibited less unexplained variance. However, when Hamilton and Wright (1982) extended Ashton's (1973, 1974a, 1974b) and Ashton and Kramer's (1980) studies, their findings failed to confirm earlier findings that increased experience led to greater consensus in judgments. One of the primary differences between Ashton's (1973, 1974a, 1974b; Ashton and Kramer 1980) studies and Hamilton and Wright (1982) was the use of different subject groups. Hamilton and Wright's (1982) subjects had significantly more experience relative to the Ashton (1973, 1974a, 1974b; Ashton and Kramer 1980) studies.

Meixner and Welker (1988) extended Ashton's studies (1973, 1974a, 1974b) by incorporating different measurements of experience representing situational and organizational experience. Organizational experience refers to a staff auditor's time

working with a particular manager and audit group, while situational experience refers to the subject's duration with the firm. Their findings indicated that the situational experience was not related to higher consensus among staff auditors; however, increased consensus among staff auditors was found with increased organizational experience (Meixner and Welker 1988). Meixner and Welker's (1988) lack of situational findings were confirmed when Wright (2007) found that graduate business students provided less biased judgments along with a greater consensus in their judgments than audit seniors and managers in a loan judgment task. Additionally, Wright's (2007) study may indicate that similar training, as indicated by the findings with the graduate students' class relative to professionals, leads to greater similarity in judgment. Wright's (2007) study relates to the current study in that auditors typically have greater similarity in training relative to managers and should, therefore, have greater consensus in their judgments than managers.

Domain specific knowledge may be a better indicator of expected group consensus. Prior to SOX, auditors were required to gain an understanding as to whether the internal controls in place were sufficient to provide reasonable assurance that material misstatements would be prevented or detected. Auditors have extensive experience analyzing internal controls in relation to their impact on financial statements. Prior to the implementation of SOX, managers were not generally required to evaluate internal controls and would have less exposure to the internal control evaluation process relative to ICFR. Auditors' internal control knowledge could be viewed as domain specific knowledge that managers were not required to develop until the implementation of SOX.

Domain specific knowledge research has found that experts in standard auditing situations have higher consensus than novices and conform more consistently with firm standards (Bedard 1991). Auditors typically receive similar training across organizations in contrast to managers' training which tends to be very specialized relative to their responsibilities. The direct experience of auditors with internal control effectiveness judgments could lead to a higher consensus by auditors than by management.

The common knowledge base shared by managers will differ significantly based on the position for which they have been trained, as well as the organization in which they have been trained. Limited research has been conducted to gain more insight into the differences between managers and other subject groups. Previous research comparing managers' judgments and perceptions has focused on the impact of culture (Burcher et al. 2007; deCamprieu et al. 2007; vanDriel et al. 2007; Zhang et al. 2007; Noer et al. 2007; Matviuk 2007) and experience (Athey 1993; DuPont and Craig 1996; Giacobbe-Miller et al. 1998; Smith et al. 1999; Wimalasiri 2001; Duffy et al. 2006). A semantics study looked at differences in judgments on the semantic meaning of specific management accounting concepts between managers and accountants and the organizational differences that exist between companies (Johnson et al. 1999). While the study was conducted to understand the differences in perceptions of specific concepts, their findings suggest that the subject's perceptions or judgments may differ based on a subject's organizational affiliation. Bedard (1991) found that with increased domain specific knowledge, less variation in judgments was provided. Based on Bedard's (1991) findings, it is anticipated that greater variation exists in the internal control effectiveness

judgments provided by management than by auditors due to the suspected differences in domain specific knowledge.

> **H1:** There is less consensus among management than auditors regarding internal control effectiveness judgments.

Determining whether there is a significant difference in the variances between auditors and management is important. These potential differences in variance could explain whether significant differences exist in the range of responses provided rather than just differences in the means, which will be discussed in section 2.2. If differences exist in the range of judgments provided, this could be cause for concern due to the uncertainty in judgment that may exist between auditors and management.

2.2 Primacy and Recency Effects

Psychology research has identified two primary order effects: primacy and recency. Primacy refers to the tendency that individuals have to anchor their judgments based on the initial information viewed and not appropriately incorporate subsequent information. Primacy is found when belief revision is more negative if positive information follows negative information (Anderson and Maletta 1999). Recency refers to the greater reliance on information received later (Marsh and Ahn 2006).

Outside of controlling for the order effects in research designs, limited studies have investigated the effects of primacy in behavioral accounting research. Two studies that directly discuss the results related to primacy are LaSalle (1997) and Anderson and Maletta (1999). LaSalle (1997) focused on the ethical judgments made by students. The

findings indicated that primacy did not exist in accounting students' ethical judgments; however, recency existed in their judgments (LaSalle 1997). A second study examining primacy in business decisions was Anderson and Maletta (1999), who focused on the likelihood of error judgments and audit planning decisions. Anderson and Maletta found that auditors are subject to primacy in providing judgments, or they revised their judgments more negatively when positive information followed negative information. Anderson and Maletta (1999) confirmed a primacy effect can exist in auditors' judgments, while other behavioral accounting research has focused on recency effects.

While accounting research has found limited confirmation regarding the existence of primacy (Anderson and Maletta 1999) in behavioral accounting studies, recency has been confirmed repeatedly (Ashton and Ashton 1988; Asare 1992; Messier 1992; Messier and Tubbs 1994; Trotman and Wright 1996; LaSalle 1997; Cuccia and McGill 2000; Monroe and Ng 2000; Green 2004; Guiral-Contreras et al. 2007). Ashton and Ashton (1988) were the first to perform research regarding the existence of order effects in behavioral accounting research. Ashton and Ashton (1988) conducted multiple experiments to understand the effect of evidence order on auditing judgments. Their findings (Ashton and Ashton 1988) indicated that subjects tended to change their judgments when new evidence was presented. Those adjustments to their judgment were greater when evidence conflicted with their earlier judgment (Ashton and Ashton 1988). Ashton and Ashton (1988) created the groundwork for future research regarding the order information is presented to subjects and the impact order has on subjects' subsequent judgments. While subjects' judgments were impacted, it is important to understand

whether there are practical implications of those differences in judgments. Messier (1992) found that recency exists in auditors' judgments based on the sequencing of evidence; however, recency did not change testing or issuance of the audit report by auditors in the experiment. In contrast to Messier's (1992) findings, Asare's (1992) findings indicated that auditors were more likely to issue unqualified opinions when mitigating evidence followed the contrary evidence. In Asare's (1992) study, auditors received four pieces of evidence related to the going concern of a firm, two suggesting the firm would fail, contrary evidence, and two confirming their continuance, mitigating evidence. When auditors received evidence of failure followed by evidence of viability, they were more likely to issue an unqualified opinion. The conflicting evidence presented by Messier (1992) and Asare (1992), regarding the issuance of audit opinions, suggests there are practical issues that should be considered based on the ordering of information. These findings indicate that in certain circumstances auditors may be more susceptible to recency effects and should, therefore, consider the potential impact to the audit.

Recency research has also focused on the factors that may diminish the recency effects in experiments. Butt and Campbell (1989) found that prior beliefs impacted the recency effect. Introducing accountability into the research design mitigated recency effects (Kennedy 1993). Messier and Tubbs (1994) found that experience lessened the impact of recency on judgments. Cuccia and McGill (2000) found that the existence of context-specific knowledge mitigated recency effects.

H2: Subjects receiving primarily strong cases first will exhibit recency effects by adjusting their internal control effectiveness judgments to be more conservative during the second half of the cases than those receiving primarily weak cases first.

2.3 Cue Reliance

Studies (Ashton 1973, 1974a, 1974b; Ashton and Brown 1980; Ashton and Kramer 1980; Hamilton and Wright 1982) conducted prior to SOX using instruments similar to the current study found that cues relating to the separation of duties were relied upon the most and explained the majority of the variance. Ashton and Kramer (1980) found that students' reliance on separation of duties cues was less than that of auditors. These findings indicate that subject groups may rely on cues differently in their evaluation of internal control effectiveness.

Ashton and Brown (1980) modified Asthon's (Ashton 1973, 1974a, 1974b) initial instrument by changing the original cue ordering. Prior to Ashton and Brown (1980), separation of duties cues had always been the first cues on the internal control checklist and accounted for the greatest amount of variance (Ashton 1973, 1974a, 1974b). Ashton and Brown (1980) suspected the cue ordering may have impacted the reliance auditors had on those cues. Ashton and Brown (1980) included two orderings of the cues to understand if including the separation of duties cues later in the instrument would lessen the reliance subjects placed on them. Ashton and Brown's (1980) first ordering was the original order of the cues from Ashton (1973, 1974a, 1974b) plus two additional cues. The second ordering presented the separation of duties cues later in the instrument. The internal control cues that had explained a significant amount of variance in prior studies

were related to the separation of duties. An additional internal control cue was found to be statistically significant when the cues were reordered (Ashton and Brown 1980). That cue was the prior year's internal control findings. However, the prior year's internal control findings were only significant when separation of duties cues were not included as the first internal control cue of the instrument. While the prior year's internal control findings were statistically significant when separation of duties cues were not included first, the prior year's internal control findings still explained very little additional variance relative to the amount of variance explained by the separation of duties cues. Based on Ashton and Brown's (1980) study, it does not appear that ordering of the cues will significantly alter the results when there are several clear internal control cues that individuals will recognize as being the most significant in making their judgments.

Three primary objectives exist for internal controls in an organization: "effectiveness and efficiency of operations, reliability of financial reporting, compliance with applicable laws and regulations (Steinberg et al. 2004) (p. 122)."

> "The first category addresses an entity's basic business objectives, including performance and profitability goals and safeguarding of resources. The second relates to the preparation of reliable published financial statements, including interim and condensed financial statements and selected financial data derived from such statements, such as earnings releases, reported publicly (COSO 2006)."

The final objective focuses on whether the organization is following all appropriate laws and regulations. Managers should focus their attention on all three objectives. However, auditors are responsible for providing an opinion on the ICFR and, therefore, should focus primarily on the second internal control objective. If auditors were to focus on all objectives of internal controls, the additional work could be detrimental to performing an

efficient audit. Therefore, it is expected that the cues related to the reliability of financial reporting would be most significant for auditors. Auditors are required to evaluate whether there are violations of applicable laws and regulations that have a direct, material effect on the financial statements (AICPA 1989). Any direct effects to the financial statements caused by violations in applicable laws and regulations should be incorporated into the ICFR analysis (Agami 2006).

H3a: Auditors will rely more than management on cues related to the reliability of financial statements in forming their internal control effectiveness judgments.

Managers, however, would be expected to have a broader focus when evaluating internal controls, incorporating all objectives of internal controls into their analysis.

H3b: Management will rely more than auditors on the cues related to effectiveness and efficiency in forming their internal control effectiveness judgments.

2.4 Auditor Judgment Influences

Prior research has not examined whether auditors and managers make similar judgments when given the same information. Auditors are directed by the AICPA to exercise professional skepticism when evaluating whether material misstatements exist within the financial statement due to error or fraud (AICPA 2002). Professional skepticism refers to the auditor's attitude of "…a questioning mind and a critical assessment of audit evidence" (AICPA 2002, AU 316.13).

In addition to auditors being directed to take a professionally skeptical attitude, the client structure has shifted with "Big 4" audit firms since Arthur Andersen and Enron. "Big 4" accounting firms have reduced the potential risk in their client portfolio. Rama

and Read (2006) found that auditor retention and client acceptance policies have become more conservative post-SOX, indicating a lower tolerance for client risk. By requiring auditors to issue an opinion on ICFR, auditors may feel more accountable to investors and the audited corporation and produce more conservative judgments. Research has found when accountability increased auditors' materiality judgments were more conservative and contained less variance (DeZoort et al. 2006). It is expected with the increased accountability, due to the ICFR opinion, that auditors' judgments may be more conservative than prior to SOX.

Additional research (Kaplan et al. 2008) looked at the effect of senior auditors' experience and the favorableness of the internal control assessment by managers on the senior auditors' reliance on the information provided by management. Findings indicated that the length of experience affected the reliance on the assessment given by management. Seniors with greater experience were less influenced by management's assertions and provided less favorable assessments of the internal controls.

While auditors are charged to view audit evidence with a professionally skeptical view, pre-SOX findings indicated that the additional costs of extending the audit might cause auditors to be willing to accept more risk. Patterson and Smith (2003) found that when costs of extending the audit were too high the subjects were willing to make less conservative judgments and this led to an increase in the overstatement of managers' earnings.

2.5 Manager Influences

While auditors are directed to exert professional skepticism, managers have conflicting objectives. Managers must balance their responsibility to the organization, for which they are acting as agents, and their own personal desires, such as compensation. While research has not examined the judgment of managers with respect to assessments of internal controls, research has found that investors believe that managers are subject to greater liability with respect to the financial statements when a management report on internal controls (MRIC) or audit report on internal controls has been conducted (O'Reilly-Allen and McMullen 2002). This increased liability could lead managers to make more conservative internal control effectiveness judgments than they would have prior to an internal control report being issued.

In contrast to the potential for more conservative judgments due to higher accountability, managers may make less conservative judgments for personal and organizational motivations. Research (Lam and Chng 2006) has found a relationship exists between executive stock options and firm performance, implying that improved firm performance increases executive stock options. While incentives have not been tied directly to internal control assessments, there is a relationship between the internal control weakness disclosure and the stock price (Gupta and Nayar 2007). Management's compensation could be tied directly to the stock prices or their potential stock compensation. Additionally, Chen et al. (2006) found that stock-based compensation induced risk-taking behavior in banking executives. AIG's recent problems have placed an increased scrutiny on the compensation packages provided to banking and insurance

executives. With the payment of $450 million in bonuses to employees of an AIG area that was the driving force behind a $40.5 billion loss (Pleven et al. 2009), the compensation and the impact of the compensation on judgments were called into question by the government and the public. Banking executives have admitted that their compensation structure may have contributed to the financial crisis (Fidler 2009). With the recent financial crisis, it became apparent that individuals were willing to make riskier decisions for their own financial gain. This increase in risk-taking behavior might lead auditors to decrease their detection risk, increasing the amount of evidence and experience necessary to audit the client, when management's compensation is linked to performance, regardless of whether it is measured by financial or nonfinancial measures (Dikolli et al. 2004). The links found between compensation, company performance, and risk acceptance may indicate that management is more willing to take a riskier position in their subjective assessments of internal controls to meet incentive requirements.

Managers may make less conservative judgments to benefit the organization. For example, Moody's disclosed that organizations with "Category B" (i.e., company-level) material weakness may be brought before a ratings board to determine whether a change in rating is necessary (Doss 2004). Category B weaknesses could include the following: an ineffective audit committee, an ineffective financial reporting process, or an ineffective control environment. The potential threat of finding material weaknesses that would fall into Category B may cause managers to make less conservative judgments to avoid a potentially lower rating that could affect their stock price. Gupta and Nayar (2007) found that the admission of an internal control weakness was enough to initiate a

negative price reaction for the company's stock. This reaction was only partially negated if management recommendations for fixing the weakness were disclosed along with the weakness.

While Gupta and Nayar (2007) focused on the overall effect of an internal control deficiency release, Beneish et al. (2008) evaluates whether the type of control deficiency, Section 302[4] or Section 404,[5] impacts the market reaction. Their findings indicate that the market reacts negatively to Section 302 deficiencies and are indicative of lower quality financial reporting. Auditor quality, as defined by auditor size, lessened the effects of the internal control deficiency release. Findings also indicated that SOX Section 404 deficiencies did not impact the financial market. Additionally, Hammersley et al. (2008) examined specific characteristics of Section 302 deficiencies to determine if those characteristics impacted the market reaction to the control deficiency releases. Characteristics of the Section 302 deficiency that were related to the market impact included the severity of the deficiency, management's assertions regarding the effectiveness of internal controls, the auditability of the internal control weakness, and the vagueness of the disclosures (Hammersley et al. 2008).

[4] Section 302 of SOX refers to the requirements of management that they have reviewed and signed off as to the effectiveness of internal controls, particularly during the period of time in which the reports are prepared (U.S.C 2002).

[5] Section 404 of SOX requires management and auditors to report on the adequacy of the internal controls in place at the organization over ICFR. The report is required to state that it is the responsibility of management to "…establish and maintain an adequate internal structure and procedures for financial reporting" (U.S.C 2002).

In addition to market reactions, managers face increased audit fees if they are found to have internal control deficiencies. Hogan and Wilkins (2008) found that there were higher audit fees for firms reporting internal control deficiencies than those that did not, especially if the client was within the first two years of being with the audit firm and highest for former Arthur Andersen clients. Additionally, the severity of the internal control deficiency was related to the increase in fees (Hogan and Wilkins 2008).

While both auditors and managers have reasons to make more or less conservative judgments, based on previous research it is difficult to surmise whether one group possesses enough motivation to have a significant difference in internal control effectiveness judgment from the other group. The lack of comparative research of auditors and managers leads to the following research question.

RQ1: Do auditors and management make different internal control effectiveness judgments?

CHAPTER 3
RESEARCH METHODOLOGY

This chapter presents the research methodology utilized to test the hypotheses developed in Chapter 2. This study employed a mixed design, utilizing both within- (subjects completed all 32 cases) and between-subject manipulation (case order). The subjects provided three separate internal control effectiveness judgments for each of the 32 cases.

Two independent variables are included in the research design, case order and profession. One of the two independent variables, case order, was manipulated between two orderings, strong and weak. Two methods were utilized to incorporate the independent variable of auditor or management into the instrument. The first method to control for the independent variable was through the firm contact. The firm contact was sent a brief summary of the study's purpose and what would be required of any participants. These contacts were working either in management or auditing roles. They were asked to forward the introduction email to individuals they believed would be appropriate participants for the study. The second method to control for the independent variable of profession was included in the initial instructions for the study. The instructions indicated the role the subjects should put themselves in when responding to the study. In addition to these two methods, a control was included that asked the subjects whether they worked as an auditor in public accounting. Only one individual answered "No" to this when responding to the auditor instrument and was excluded from analyses.

Two dependent variables were measured. The first dependent variable is the subject's internal control effectiveness judgment as measured by the subject's internal control effectiveness rating. A second dependent variable was collected to examine the subject's self-insight into their internal control effectiveness judgments. Each subject allocated 100 points among the six effectiveness cues to indicate the strength of their reliance on a specific cue.

The remaining sections in this chapter discuss in detail the research methodology utilized in this study. The first section details the experimental design and independent variables utilized. The second section of this chapter specifies the dependent variables that were measured by the research instrument. The third section describes how subjects were obtained and their demographic composition. The fourth section discusses the distribution of the experimental materials. The final section describes the experimental materials used in the study.

3.1 Design and Independent Variables

This study employed a mixed design, utilizing both within- (subjects complete all 32 cases) and between-subject manipulations (case ordering and professional role). The research design can be seen in Table 1.

		Professional Role	
		Auditor	**Management**
Case Orderings	**Strong**		
	Weak		

Table 1. Research Design

The research design was a 2x2 factorial design. The two between-subject independent variables were professional role and case ordering. The case selection and ordering is based on prior studies (Ashton 1973, 1974a, 1974b) and manipulated between subjects. Approximately half of the subjects received the strong case ordering and half received the weak case ordering. The cases were chosen by Ashton to allow for analysis of all main effects and two-way interactions of the cues included in each case. The case selection and ordering is discussed in greater detail in Section 3 of this chapter.

While prior studies (Ashton 1973, 1974a, 1974b; Ashton and Brown 1980; Ashton and Kramer 1980; Meixner and Welker 1988; Trotman et al. 1983) have investigated internal control judgments, these studies were conducted prior to the implementation of SOX requirements. Since the implementation of SOX requirements, internal control evaluations are now required of all public companies to determine whether they have appropriate internal controls in place to present reliable financial information to investors. Both auditors and management are now required to make these judgments. Prior to the implementation of SOX, studies focused only on the auditors' internal control effectiveness judgments as they were the individuals primarily concerned

with ICFR. The research design of this study explores whether their professional role, auditor or management, impacts the internal control judgment.

3.2 Dependent Variables

Two dependent variables were measured in the current study. The primary dependent variable of interest in the current study is the internal control effectiveness judgments. The internal control effectiveness judgment was collected through a Likert type scale rating. Three internal control effectiveness judgments were made for each case: effectiveness and efficiency of operations (EEO), reliability of financial reporting (RFR), and SOX required evaluation. There were 32 internal control effectiveness cases rated by the subject for each of the three previously listed objectives. These three objectives are meant to represent two of the three COSO internal control objectives as well as the required SOX judgment for publicly traded companies. A second dependent variable was collected to examine whether differences in self-insight existed between varying levels of experience, as prior literature (Trotman et al. 1983) had found. The self-insight dependent variable was collected through an allocation of 100-points to each internal control cue to indicate the subjective reliance on specific internal control cues.

3.2.1 Internal Control Effectiveness Judgments

The primary dependent variable of concern in this study is the internal control effectiveness judgment that is made in relation to each case. Specifically, three internal control effectiveness judgments were made by the subjects. The first two judgments represent two of the internal control objectives as defined by COSO: effectiveness and

efficiency of operations and reliability of financial reporting. The third COSO objective, compliance with applicable laws and objectives was excluded. Based on discussion with practitioners, it is difficult for auditors to separate the future ramifications of noncompliance with applicable laws and regulations from the reliability of financial reporting. Due to the difficulty of disentangling these objectives, no cues were developed to encompass the compliance with applicable laws and regulation objective.

The final internal control effectiveness judgment made by the subjects was representative of the judgment auditors and management make to be in compliance with SOX Section 404. This change allows analysis of interdependencies of the three judgments, as well as, whether differences exist between the reliability of financial reporting and SOX judgment. The existence of differences between the reliability of financial reporting and the SOX judgment may indicate that the subjects believe there is additional information that needs to be considered when making the SOX judgment. These internal control effectiveness judgments represent potential objectives of internal controls.

The subjects made three judgments on 32 cases. The current study uses a seven-point scale, with extremes points represented by "Extremely Weak" and "Strong." Prior studies have utilized similar rating scales. Ashton's (1973) pilot testing included a rating scale with eight items, representing a more balanced scale of positive and negative ratings. He found that subjects had difficulty in distinguishing the positive end of the scale and reduced his final instrument to the six-point scale that was utilized in the current study's pilot testing. After reviewing pilot test data of the current study, subjects

seemed apprehensive to rate the cases as "Adequate to Strong." On average, subjects in the pilot testing only judged the cases as being "Adequate to Strong" 10 out of their 96 judgments.

In addition to pilot test findings, research (Rama and Read 2006) suggests that auditors are becoming more conservative with the implementation of SOX requirements. With the increase in conservatism, subjects may be unwilling to rate internal controls as being strong when all internal controls are in place. Based on pilot testing and changes to the regulatory environment since the last completion of a similar study, it was decided to modify the six-point scale to a seven-point scale, separating the last point of the scale into two distinct points, "Adequate" and "Strong."

3.2.2 Cue Reliance

In addition to the individual case judgments, the subjects allocated 100 points across each cue to indicate their reliance on each of the cues when determining their internal control effectiveness judgments as related to the SOX required evaluation. This allocation is similar to other studies and can be seen in Appendix E. The allocations were used to investigate the subject's self-insight, or ability to understand whether they are cognizant of the information on which they base their judgments. Additionally, these cues provide some insight into the judgment process utilized by auditors and management.

While rankings of the internal control cues could have been used to understand the relative importance of each cue, ranking would have created difficulties if subjects

felt that cues were of equal importance. Additionally, ranking the cues would have forced individuals to place value on certain cues for making their judgments when they felt there was no importance to that specific cue. Allocation of one hundred points, allowed subjects to place great importance on multiple items, but minimal or no importance on other cues. SurveyMonkey.com was used to collect all data. SurveyMonkey allows for certain requirements prior to continuing with the study. For example, if there were specific questions that must be answered, SurveyMonkey would not allow subjects to proceed in the survey without responding to that question. With the allocations, SurveyMonkey required all subjects' allocations to equal one hundred before they were permitted to continue with the remainder of the study. Information regarding the allocations made by subject groups can be seen in Table 2. If subjects completed the instrument in hardcopy, there is the additional risk that subjects miscalculated the points and over- or under-allocated the 100 points between the six cues. Two management subjects chose not to allocate the 100 points, and, therefore, there are two fewer individuals in the subject pool than in the instrument regarding their judgments provided on each case for analyses provided in Table 2, Table 3, and Table 5. The following tables represent subjective reliance as indicated by the allocations provided by the subjects. Analysis discussed in Chapter 4 will focus on the objective reliance on specific cues as measured by Beta coefficients.

Cue Allocation					
Cue	N	Min.	Max.	Mean	Std. Dev.
Any adjustment to the price or quantity of inventory is related to an actual change in price or physical inventory difference.					
Auditors	34	10	50	20.97	10.693
Management	25	5	50	25.80	10.071
Overall	59	5	50	23.02	10.621
Lead time is known for customer deliveries or to replenish inventory stock.					
Auditors	34	0	30	6.73	6.797
Management	25	0	25	5.77	5.912
Overall	59	0	30	6.35	6.418
All supply chain processes have been mapped to identify value-added and non-value added activities, bottlenecks, cycle time, etc.					
Auditors	34	0	35	10.29	8.062
Management	25	0	55	9.00	11.551
Overall	59	0	55	9.79	10.148
Any adjustment to the price or quantity of inventory is recorded.					
Auditors	34	10	50	25.15	10.503
Management	25	15	80	30.64	12.493
Overall	59	10	80	27.47	11.612
A quality control process is in place for reviewing inventory prior to distribution to the client.					
Auditors	34	0	30	12.85	8.877
Management	25	0	45	10.70	10.877
Overall	59	0	45	11.98	9.698
Products returned by the customer are accurately recorded in the correct period.					
Auditors	34	3	50	24.21	10.713
Management	25	5	50	20.72	8.900
Overall	59	3	50	22.73	10.055

Table 2. Average Allocations by Auditors and Management

Previous research (Ashton 1974b; Ashton and Kramer 1980; Trotman et al. 1983), using a similar instrument, found that each cue had at least one individual that felt that a particular cue was of primary importance for determining the strength of the internal control system. Similar to prior literature (Ashton 1974b; Ashton and Kramer 1980; Trotman et al. 1983), at least one individual ranked each of the cues as the cue they relied upon the most as seen in Table 3.

		Internal Control Cue					
		1	**2**	**3**	**4**	**5**	**6**
Cue Ranking	**1**	29	2	5	34	5	25
	2	8	1	2	16	8	10
	3	9	4	2	5	8	17
	4	7	15	29	2	27	5
	5	4	19	17	2	8	2
	6	2	18	4	0	3	0

Table 3. Frequency of Cue Reliance Ranking.[6]

The current study's findings indicate that both management and auditors indicated they relied the most on those cues related to the reliability of financial reporting (Cues 1, 4, and 6).

Cue allocations were also reviewed by splitting the rankings between auditors and management. This analysis was done to more clearly understand whether there were

[6] Some subjects weighted cues identically, resulting in a tie between two or more cues. When the subject's allocations resulted in a tie, the cues were given the same rank and the next highest allocated cue was given the next available rank. For example, the highest allocation of 30 was given to two cues; those two cues were both ranked 1. The next highest allocated cue was then ranked third.

specific cues that were subjectively rated as more important in forming the auditors' or management's judgments. The cue rankings by subject group, shown as a percentage of the subject group providing the ranking, can be seen in Table 4.

			Internal Control Cue					
			1	**2**	**3**	**4**	**5**	**6**
Cue Ranking	**1**	Auditors	44.1	2.9	8.8	47.1	5.9	55.9
		Management	56.0	4.0	8.0	72.0	12.0	24.0
	2	Auditors	14.7	2.9	5.9	29.4	20.6	11.8
		Management	12.0	0.0	0.0	24.0	4.0	24.0
	3	Auditors	8.8	8.8	2.9	11.8	14.7	20.6
		Management	24.0	4.0	4.0	4.0	12.0	40.0
	4	Auditors	14.7	20.6	47.1	5.9	44.1	5.9
		Management	8.0	32.0	52.0	0.0	48.0	12.0
	5	Auditors	11.8	29.4	26.5	5.9	11.8	5.9
		Management	0.0	36.0	32.0	0.0	16.0	0.0
	6	Auditors	5.9	35.3	8.8	0.0	2.9	0.0
		Management	0.0	24.0	0.0	0.0	8.0	0.0

Table 4. Cue Ranking Percentages by Subject Group

The internal control cues related to reliability of financial reporting (Cues 1, 4, and 6) received the highest rankings by both auditors and management. Between those three internal control cues, there are some differences between subject groups regarding which of the three internal control cues is relied upon the most by subjects. Cue 6 related to the accurate recording of a return by a customer was ranked the highest by auditors with 55.9% of auditors ranking this the highest of the internal control cues, while management

only ranked this item the highest 24.0% of the time. Management ranked Cue 4 the highest 72.0%, while only 47.1% of auditors ranked this cue the highest. Auditors and management are both clearly relying on those cues related to the reliability of financial reporting when providing SOX judgments, but there are some cues on which each group places the most emphasis.

Allocations were additionally separated into the two internal control objectives each cue satisfied: effectiveness and efficiency of operations or reliability of financial reporting. Results of the breakdown by the internal control objective can be seen in Table 5.

Cue Allocation by Objective

Cue Objective	N	Min.	Max.	Mean	Median	Std. Dev.
Effectiveness and Efficiency of Operations (Cues 2, 3, and 5)						
Auditors	34	0	75	29.6765	30	19.246
Management	25	0	60	22.8400	25	16.444
Overall	59	0	75	26.7797	25	18.282
Reliability of Financial Reporting (Cues 1, 4 and 6)						
Auditors	34	25	100	70.3235	70	19.246
Management	25	40	100	77.1600	75	16.444
Overall	59	25	100	73.2203	75	18.282

Table 5. Cue Allocation by Objective

Based on the cue allocations provided by auditors and management, the majority of the subjects allocated more points to the cues related to the reliability of financial reporting

than to the effectiveness and efficiency of operations. Based on the differences between auditors and management, auditors placed additional reliance on effectiveness and efficiency of operation cues relative to management when providing SOX internal control effectiveness judgments. Based on the overall percentages of reliance on effectiveness and efficiency of operations (EEO) and reliability of financial reporting (RFR), auditors believe they are relying on the EEO cues to a greater degree than management. The percentages found in Table 5 represent only the subjective reliance provided by the subjects and are not necessarily representative of their actual reliance on each cue when providing a judgment. Their objective reliance on the cues to form their judgments will be discussed further in Chapter 4.3.

The cue allocations represent subjective ratings of the subjects' reliance, which could be flawed. However, based on their internal control effectiveness judgments, an objective basis can be calculated to determine which of the cues they have significantly relied on subconsciously. Statistical weightings were calculated for each subject by running a regression for each subject. The statistical weighting is indicated by the regression coefficient of each cue. The statistical weightings represent the objective weightings, or the cues that the individual actually relied upon when making their case judgments (Ashton 1973, 1974a, 1974b). A discrepancy between the subjective judgments and the objective ratings could be an indicator that subjects have poor self-insight into their judgments. Poor self-insight would be indicated if the subject believes they have relied upon a specific set of cues, based on their allocation of points to the cues, when their internal control effectiveness judgment indicates that they relied upon

different cues to make their judgments. Poor self-insight might lead to the subjects looking for evidence to support their judgment and ignore other evidence that should have been considered.

3.3 Participants

The subject groups of interest are those individuals that would be most affected by the implementation of SOX requirements and the understanding of their judgments surrounding the internal controls in place in an organization. Previous research has focused solely on the auditor's judgment surrounding internal controls. However, with the implementation of SOX requirements, it would be beneficial to understand if auditors' and management's internal control judgments differ when they receive the same cues as to internal control effectiveness.

3.3.1 Auditors

Primarily "Big 4" auditors were recruited through personal contacts at all of the "Big 4" firms. Additional auditor subjects were recruited through other national, regional, and local CPA firms. The subjects consisted of a range of experience levels from staff to partner. The majority of the subjects were either at the senior or manager level. Primarily "Big 4" auditors were used due to their increased exposure and understanding of the SOX requirements relative to other sized auditing firms.

Demographic information was collected regarding the subject's personal and professional experience and knowledge of internal controls. The instrument was started 51 times, 14 individuals were excluded from analysis because they did not complete the

full instrument, and two additional individuals were excluded due to their inattention to the instrument.[7] One additional subject was excluded from the final analyses due to their "No confidence" rating on their SOX knowledge, resulting in 34 final auditor subjects. Average external audit experience of the subjects was 64.9 months, with a range of 4 to 360 months, and a mean total business experience of 81.3 months. Additional demographic measures regarding work experience, industry specialization, and certifications can be seen in Table 6.

[7] The two individuals that were excluded from final analysis provided either identical judgments to almost every case (6s or 7s) or provided a ranking of 1, "Extremely Weak," to Case 22, which was comprised of all Yes responses to the cues. Other individuals had provided lower than a 6 or 7 to this case, but the internal control effectiveness judgment provided for the case with all Yes responses was the highest judgment they provided for the 32 cases.

Panel A. Auditor Discrete Measures		
Attribute	Level	N
Firm Position	Staff	8
	Senior	13
	Manager	11
	Principal/Partner	2
Firm Size	Big 4	25
	National	3
	Regional	0
	Local	6
Education	Bachelor's Degree	19
	Some Graduate Coursework	3
	Master's Degree	12
	Doctoral Degree	0
Gender	Female	20
	Male	14
Age	18-24	8
	25-34	24
	35-40	1
	Over 40	1
Industry Specialization	Yes	12
	No	22
Certifications	CPA	26
	Other	0
Sarbanes-Oxley Training	No Training	3
	CPE	23
	Firm	28
	College Courses	10
	Self Study	14
	Other	0
Confidence in Sarbanes-Oxley Knowledge	1 – Not at all confident	0
	2	10
	3	12
	4	10
	5 – Highly confident	2

Panel B. Continuous Measures					
Attribute	N	Minimum	Maximum	Mean	Std. Dev.
External auditing experience	33	4	360	64.91	65.686
Internal auditing experience	9	2	30	13.00	14.933
Tax experience	8	3	120	38.12	40.173
Accounting experience, excluding public accounting	6	6	24	16.33	7.967
General business experience	6	8	60	29.83	23.953
Total Experience	34	8	480	81.26	84.043

Table 6. Auditor Demographic Information[8]

3.3.2 Management

Management was recruited using several methods. Subjects were recruited through personal contacts at a number of organizations, continuing professional education (CPE) courses provided by a state CPA society, and a minimal number through an MBA course.[9] The companies included a range of industries: telecommunications, pharmaceuticals, banking, insurance, and merchandising. The limited number of subjects collected from a single industry did not permit analyses by industry.

Due to the varying titles between corporations, it is difficult to compare individuals by title across firms. A range of titles completed the instrument from the

[8] One subject did not complete every question in the demographics and was not included in the external audit experience.

[9] It is not possible to determine the number of subjects that were received through CPE courses and the executive MBA program. The two groups received a study invitation within a similar time frame. The management's completed education level was reviewed and found only one subject that had completed some graduate work and would likely be enrolled in the executive MBA program when completing the study.

management perspective. Some of the professional titles of individuals completing the instrument were CFO, Treasurer, and Director. However, due to the varying titles and lack of comparability between organizations, it is difficult to analyze the data received based on current title. Additional analyses was conducted to determine if the subjects recruited later in the process, primarily the MBA students and CPE participants, provided responses that were significantly different from those management subjects collected earlier. A variable representing the completion date and time was incorporated into the analyses. The higher the variable, the later the instrument was completed in the collection process. Findings did not indicate that responses collected later in the process provided significantly different responses from those collected earlier.

The management instrument was started 54 times and completed 35 times. One additional subject was excluded from analysis after reviewing their case judgments. It was found that the subject responded to Case 11, the only case with all "No" responses to the cues, with a 6. It would be expected that this case would be their lowest judgment of all of the cases, but it was this subject's highest, and was, therefore, excluded from analysis. Nine additional management subjects were excluded from analysis, due to their response to their self-reported confidence in SOX knowledge level or lack of response. Subjects with "No confidence" were excluded from analyses due to their expected lack of exposure to SOX judgments.[10] Average total experience of the final management

[10] The nine excluded subjects' demographics were reviewed to determine if there were specific attributes that differed from subjects providing a higher confidence rating. The management subjects providing ratings of less than 2 on the SOX knowledge tended to work in smaller organizations and have less education.

subjects was approximately 229.8 months. Additional demographic data for management subjects can be found in Table 7.

Panel A. Management Discrete Measures		
Attribute	Level	N
Firm Position	Internal Auditor	2
	Manager/Supervisor	6
	Vice President/Director	4
	Controller/Treasurer	3
	President/CFO	3
	Accountant/Analyst	3
	Other	3
Education	Bachelor's Degree	10
	Some Graduate Coursework	1
	Master's Degree	13
	Doctoral Degree	1
Gender	Female	12
	Male	13
Age	18-24	0
	25-34	6
	35-40	3
	Over 40	16
Industry	Communications	3
	Distribution	4
	Healthcare	3
	Insurance	2
	Manufacturing	8
	Other	5
Certifications	CPA	19
	Other	6
Organization Size	International	11
	National	7
	Regional	3
	Local	4

Panel A. Management Discrete Measures (cont.)		
Sarbanes-Oxley Training	No Training	1
	CPE	16
	Firm	17
	College Courses	1
	Self Study	6
	Other	3
Confidence in Sarbanes-Oxley Knowledge	1 – Not at all confident	0
	2	7
	3	6
	4	8
	5 – Highly confident	4

Panel B. Continuous Measures

Attribute	N	Minimum	Maximum	Mean	Std. Dev.
External auditing experience	14	4	144	54.14	35.611
Internal auditing experience	9	3	96	43.22	28.243
Tax experience	6	6	180	77.00	62.862
Accounting experience, excluding public accounting	20	15	432	151.90	107.790
General business experience	8	48	330	137.25	101.593
Total Experience	25	60	648	229.80	135.35016

Table 7. Management Demographic Information

3.4 Distribution of Experimental Materials

To facilitate ease of use and more closely replicate the digital nature of much of today's review process, the experimental instrument was distributed and collected electronically with SurveyMonkey.com. To increase the likelihood of an even distribution of strong and weak case ordering completion, an external website to SurveyMonkey was designed to redirect the subjects between alternate case orderings. The initial website does not record whether an individual actually completes the full instrument, only that they have accessed the website. The lack of identification of study

completion by the subjects resulted in a higher response rate to certain case orderings, as seen in Table 8. Additionally, all individuals that started the instrument did not necessarily complete it. Based on feedback from participants, some started the instrument but returned at a later time to complete the instrument due to the time requirements necessary. The completion percentage of the instruments started and included in analyses can be seen in Table 8.

		Professional Role	
		Auditor	**Management**
Case Orderings	**Strong**	17 (63.0%)	11 (45.8%)
	Weak	17 (70.8%)	14 (46.7%)

Table 8. Instruments Completed by Included Subjects (Completion Rate)[11]

When all subjects were included in Table 8, completion rates for the instrument ranged between 60.0 to 79.2 percent.

The use of electronic collection enables the collection of the time spent responding to the survey without subjects submitting their estimation. SurveyMonkey collected the total time subjects used to complete the full instrument; however, SurveyMonkey did not collect idle time subjects used to work on other items while

[11] Ten subjects were excluded after the completion of the full instrument due to their self reported lack of confidence in their SOX knowledge. Two subjects were excluded after reviewing their responses; their exclusion was discussed previously.

completing the instrument. Large completion times by the subjects may have been caused by opening the instrument but completing outside work during the time the instrument was open. The mean completion time for the full instrument was 52.3 minutes, but completion time ranged from 13 to 508 minutes.[12] Several subjects did indicate that the time necessary to complete the instrument may have been due to failure to read the directions where it indicated that the cues and their ordering did not change throughout the instrument. Additional analysis was conducted to understand whether auditors and management took differing amounts of time to respond to the full instrument, as can be seen in Table 9.

	N	Mean	Median	Min.	Max.	Std. Dev.
Auditor	34	55.934	34.250	12.967	508.167	88.8933
Management	25	47.290	35.683	15.300	275.600	51.2209
Overall	59	52.271	34.533	12.967	508.167	74.8342

Table 9. Time Necessary to Complete Full Instrument by Subject Group

The median completion time was included due to the high variability found in the completion time. Based on the median completion time, it is clear that some individuals at the extremes are skewing the mean completion time to be higher than it necessarily took for most subjects to complete the instrument. The anticipated completion time of 15

[12] The median time necessary to complete the instrument was found to be 34.5 minutes, considerably closer to the expected completion time than the mean. When outliers (the five highest and five lowest completion times for both auditors and management) were excluded from the mean time for completion, the mean time to complete the instrument was 35.4 minutes and aligned much closer to that of the median of the sample.

to 25 minutes included in the introductory material was based on feedback provided during pre- and pilot-testing. The differences in time to complete the instrument may vary due to the pre- and pilot-test subjects being primarily students and not working professionals. As all pilot testing subjects were not primarily working professionals, their judgment process may have been significantly different from the final subjects included in the study. The pre- and pilot-test subjects could have potentially required less time to make their judgments or had fewer interruptions in completing the instrument, explaining the differences in time necessary to complete the instrument.[13]

The time requirement may have limited the number of subjects who completed the instrument. Reviewing all started instruments, a number of individuals launched the study and completed several cases but then chose to stop their participation prior to completing the full instrument, as indicated in Table 8.

3.5 Content of Experimental Materials

Most participants received an invitation email from a contact person at the organization.[14] The instrument received by the subjects was completely electronic. The instrument can be broken into six primary sections: recruitment letter (included in an

[13] Analyses were conducted on pilot-testing time requirements necessary to complete the full instrument. Mean completion time for the pilot-test instrument was approximately 27 minutes (median 21 minutes). When the two longest completion times (90 and 122 minutes) were excluded, the mean completion decreased to approximately 20 minutes (median 20 minutes).

[14] Subjects recruited from CPE courses received a hardcopy of the recruitment letter, similar to the e-mail received by other test subjects, when checking into the event with the course materials. The subjects were also reminded at the conclusion of the CPE course of the recruitment letter they received at check-in.

email from a contact person), study introduction and instructions, 32 cases, allocations, follow-up questions, and demographic information.

3.5.1 Recruitment Letter

The recruitment letter can be found in Appendix A. Firm contacts were initially contacted by telephone or through a brief email. The email explained the purpose of the study and the expectations of any individuals that would participate in the study. When pilot testing had been completed, the firm contacts were sent an email explaining that the study was open and collecting information and reminded them of the expectations surrounding the study. The email included a link to the appropriate survey site. Similar recruitment letters were used in subject recruitment for auditors and management, regardless of the contact method.

3.5.2 Study Introduction and Instructions

When the subjects clicked on the link included in the recruitment email, they were redirected to SurveyMonkey and the study introduction. All information included in the study introduction and instructions can be seen in Appendix B. The introduction to the study is very similar to that of the recruitment letter. The similarities account for the possibility that subjects may have been forwarded just the initial website and not received the recruitment letter. In addition to the information included in the recruitment letter, the introduction also informs the subjects how they could exit the study if they choose not to complete the study once they have begun.

Once the subjects read the initial screen, they progressed to a description of their assigned role, auditor or management, based on the link they initially received and the role identification indicated by the firm contact. This role should be related to their current professional roles. The information they received regarding their role can also be found in Appendix B. In addition to their roles, they were given definitions surrounding the three judgments they were asked to make for each case: effectiveness and efficiency of operations, reliability of financial reporting, and the required SOX judgment. These definitions were COSO definitions for the first two judgments and a description of the SOX judgment required.

Subjects then received a summary of select financial information. The information was based on information from public companies. No single organization or industry was included to create greater generalizability. If the industry had been defined, subjects lacking experience in that industry may have felt unqualified and, therefore, not responded to the study. The information provided regarding the financial situation of the organization in the case was limited to minimize the impact of this information on the subjects' internal control effectiveness judgments.

3.5.3 Instrument

The survey instrument is primarily based on Ashton (1973). The survey instrument can be broken into three parts: survey cues, case selection and ordering, and the internal control judgment rating scale. There were three significant differences between the current instrument and Ashton's (1973): the internal control cues utilized,

the internal control judgment ratings, and the rating scale. One of the practice cases included in the instrument can be seen in Appendix C.

3.5.3.1 Survey Cues

The difference in the cues included was necessitated by the significant changes in the internal control environment since the last completion of Ashton's (1973) instrument. Ashton's (1973, 1974a, 1974b) studies utilized payroll cues for his studies. Many of the internal controls related to payroll have been automated or outsourced since the completion of his studies, leaving little control to the company's employees. These changes also limit the procedures that auditors use to test the area.

In addition to the changes in the business environment, it is important to understand the reliance on the different objectives of internal controls as defined by COSO. COSO categorizes internal controls in three ways: effectiveness and efficiency of operations, reliability of financial reporting, and compliance with applicable laws and regulations. SOX focuses on the effectiveness of internal controls over financial reporting (COSO 2006). The previously used cues created difficulties in identifying one specific COSO objective for each cue included in the study.

Prior studies have used a number of cues, ranging from five to ten. However, studies with fewer cues have found there is lower variance, which could be attributable to the lack of variation in cues to rely upon. Trotman et al. (1983) utilized 10 cues but did not increase the number of cases included from Ashton's (1973) study. Ashton and Brown (1980) included eight cues in their study and retained a half-replication, enabling

the testing of main effects and two-way interactions, with 128 cases completed by the subjects. Hamilton and Wright (1982) used only five cues; however, this limitation allowed them to complete a full factorial design and test for all main effects and interactions. The cues that have been utilized in prior studies can be seen in Appendix D. While typically subjects want additional information upon which to base their judgments, increasing the number of cues either increases the cases that must be completed by subjects or reduces the amount of information that can be tested with the data. To retain the ability to evaluate both main effects and two-way interactions between the cues and limit the volume of information that subjects were required to evaluate, the experimental instrument included only six internal control effectiveness cues.

The cues were developed in conjunction with several practitioners. The cues are most closely related to the effectiveness and efficiency of operations and the reliability of financial reporting. Based on discussions with the practitioners, it was determined to be too difficult to disentangle the future implications of compliance with applicable laws and regulations from the reliability of financial statements. Additionally, the inclusion of compliance with applicable laws and regulations would limit the number of cues related to each objective to two, which may result in too little information for most individuals to make a meaningful judgment. Cues were reviewed by academics and practitioners to determine whether the selected cues clearly fulfilled one of the COSO objectives. Several managers with "Big 4" accounting firms reviewed the cues and confirmed the researcher's anticipated categorizations.

3.5.3.2 Case Selection and Ordering

The case selection and orderings utilized in this study are identical to Ashton's (1973) design. His case selection was designed to ensure the testing of all main effects and two-way interactions without subjects having to complete a full replication of all possible combinations. With the large number of cues, all possible cue permutations would create 64 distinct cases. Completing 64 cases would severely limit the number of subjects that were capable of completing the instrument within a reasonable time frame.

Prior studies (Ashton 1973, 1974a, 1974b; Ashton and Kramer 1980) have utilized three case orders: primarily weak cases first, primarily strong cases first, or an even mix of strong and weak cases. The findings have indicated that there are significant differences between the strong and other case presentations, but findings did not indicate that there were significant differences between the weak and mixed case presentations. Due to the lack of differentiation between the mixed case and weak case results, the mixed case ordering was excluded from the current study. The case ordering utilized for the current study can be seen in Appendix E. Subjects receive one of two mixes of cases. The strong case ordering has more strong cases in the first 11 cases, the middle 10 cases alternate between weak and strong cases, and concludes with more weak cases in the last 11 cases. A strong case refers to a case that has more "Yes" responses than "No." In this study, strong cases have either four or six "Yes" responses. The weak ordering is a reversal of the cases subjects receive in the strong ordering.

Ashton and Brown (1980) manipulated the ordering of the cues to determine whether changing the ordering of the cues affected the reliance by subjects when making

their judgments. It was found that the cue ordering only caused one additional cue to be statistically significant relative to similar studies. The newly significant cue explained very little additional variance relative to prior studies. Based on these findings, cue ordering was not manipulated between subjects.

The case ordering received by the subjects was based on the initial website included in the recruitment letter. Subjects either typed in the website address or clicked on the link included in the emailed recruitment letter. This initial website alternated subjects between the two case orderings. While this initial website did not record whether subjects had completed the full instrument, the completed instruments do show a fairly even distribution between the case orderings.

3.5.4 Follow-up Questions

Three sets of follow-up questions were utilized to understand the preference of information when making internal control judgments. The first set of follow-up questions relates to the identification of the objective each internal control cue satisfies. In addition to the six cues included in the instrument, two additional cues were included to understand whether the subjects categorized these cues differently as there were some expected ambiguities between the cues and the objective subjects believed the cue fulfilled. The two additional cues were developed in conjunction with the six cues used in the instrument, but it was found that the cues were less clear as to their internal control objective than those cues that were chosen for the final instrument.

The next question set related to the importance of each objective when evaluating the effectiveness of internal controls. Subjects were asked to compare two objectives at a time and determine their relative importance, more importance, less importance, or equal importance, when making a SOX internal control effectiveness judgment. These judgments enable the evaluation of their importance and whether subjects' judgments follow with their objective judgments, as determined by their reliance on each of the cues.

The final follow-up questions related to whether there was additional information subjects would like answered related to Acme, Inc. or their internal control environment. While the subjects were asked to base their judgments on only the information that is provided to them in the case, in a real-world situation, auditors and management would have a significantly greater basis for making their judgments. These open-ended questions allow the subjects to suggest information that may be beneficial to include in future studies. Additionally, this information allows for greater insight into the subjects' knowledge of the area, due to the specificity of their questions. Information suggested by the auditors and management represent very similar concepts. Some of the suggestions for additional information related to Acme, Inc. and internal controls can be found in Appendix F and G, respectively.

3.5.5 Demographic Questionnaire

The demographic questionnaire provides information regarding the differences in background of the subjects completing the study. Experience is measured in three ways: age, experience in the workforce in months, and certifications. In addition to experience,

an understanding of the subject's training and confidence in their knowledge as related to SOX is beneficial in interpreting the subject's internal control judgments. Subjects are asked to identify if they have received training on SOX and what type of training they have received. Additionally, the subjects are asked to identify their confidence in their knowledge of SOX. Whether training was received and their self-reported confidence in SOX knowledge will be used for additional analyses in section 4.4.

CHAPTER 4
RESULTS

This chapter discusses the analysis and results from testing the four hypotheses and research question. In addition to testing the hypotheses and research question, the final section of this chapter includes additional analyses conducted to better understand whether certain demographic characteristics impact the judgment of the subjects as well as additional analyses of the data collected. All analyses were conducted with SPSS.

4.1 Hypothesis One

Hypothesis one investigates whether the variance differs significantly between the two subject groups, auditors and management. This is important to understand whether the range of responses differs between the subject groups. This hypothesis was tested with Mauchly's *W* to determine whether sphericity existed in the judgments provided by the subjects, as is assumed by a mixed ANOVA.

Sphericity is the assumption that variances are equal between different levels of the variables being tested. To test for this, Mauchly's sphericity test was used. When conducting the analysis for Mauchly's sphericity, variable collection groups must be defined. A within-subjects factor was defined as the internal control judgment (ICJ) factor with 32 levels. Each level represents a case control judgment. Mauchly's sphericity test evaluates whether the null hypotheses of equal variances existing across groups is true. The p-value for each of these three dependent variables is 0.000, as shown

in Table 10, indicating that the test of equality of variances between groups failed and adjustments must be made when conducting ANOVAs if using a repeated measures design.

					Epsilon	
Dependent Variable	**df**	**Mauchly's *W***	**Chi-Square**	**p-value**	**Greenhouse-Geisser**	**Huynh-Feldt**
Sarbanes-Oxley Judgment	495	0.000	1,137.206	0.000	0.303	0.391
Effectiveness and Efficiency of Operations	495	0.000	904.815	0.000	0.350	0.467
Reliability of Financial Reporting	495	0.000	973.575	0.000	0.389	0.533

Table 10. Mauchly's Sphericity Test

In conjunction with testing for the assumption of sphericity, the equality of variances for each case judgment was conducted considering only a specific case judgment instead of all case judgments. Findings indicate that, while there were case judgments that did have significant variance between auditors and management, the majority of the cases did not provide statistically significant differences in error variance between the groups. Cases that had significant differences at the $p<.05$ level were Cases 1, 11, 13, and 18, as shown in Table 11. Cases were reviewed to determine whether there was a commonality between them. No clear commonality was found between the six cases that violate the equality of variance assumption.

	F	df1	df2	p-value
Case 1 SOX Judgment	4.306	3	55	0.008
Case 9 SOX Judgment	2.415	3	55	0.076
Case 11 SOX Judgment	4.788	3	55	0.005
Case 12 SOX Judgment	2.344	3	55	0.083
Case 13 SOX Judgment	2.940	3	55	0.041
Case 18 SOX Judgment	3.948	3	55	0.013

Table 11. Levene's Equality of Variance Test for Individual Cases[15]

A review of Case 11 judgments shows a relatively small range of responses from subjects, with the maximum judgment provided being a 3 and a minimum of 1. Additional analysis surrounding the individual SOX case judgments provided by the subjects can be seen in Appendix J. Based on the Mauchly's *W* and Levene's test of equality for H1, generally, auditors and management have statistically significant differences in variance in their SOX internal control effectiveness judgments. Based on these findings, additional considerations should be made when analyzing the data for independent variable effects.

4.2 Hypothesis Two and Research Question One

The study's design explores whether differences exist in judgments between two groups, auditors and management, and recency effects. The significance of these two independent variables was examined in H2 and RQ1 and represents the primary focus of the study. There are two primary methods that could be utilized to test H2 and RQ1: a

[15] All other cases were excluded from Table 11 as their p-values were greater than 0.10. A complete table of the findings for Levene's equality of variance by individual case can be found in Appendix I.

mixed analysis of variance (ANOVA) incorporating all individual case judgments and a multivariate analysis of variance (MANOVA).

There are four assumptions that should be met when using a mixed ANOVA. For a mixed ANOVA those assumptions are independence, normal distribution of data, homogeneity of variance, and sphericity (similar to the homogeneity of variance assumption in a traditional ANOVA) (Field 2009). Of these, the independence of the observations is the only assumption that was met for the repeated measures mixed ANOVA.[16] Based on the number of violations of the repeated measures mixed ANOVA assumptions and the severity of the sphericity violation, the MANOVA assumptions were tested to determine if this was a more robust method of testing the data as the results of a MANOVA are unaffected by the violation of the sphericity assumption found by Mauchly's *W* (Misangyi et al. 2006) shown in Table 10.

The four MANOVA assumptions are independence, random sampling, multivariate normality, and homogeneity of covariance matrices (Field 2009). The first

[16] A repeated measures mixed ANOVA was run along with the tests used to determine whether the data met the assumptions of an ANOVA. Normality of the data distribution cannot be tested overall but must be tested on the individual case judgments. Normality of the cases was tested in two ways: visually and by reviewing the z-scores of skewness and kurtosis. While many of the individual case judgments were normally distributed, there were several cases that violated the normality of the data distribution assumption. Individual case judgments were also reviewed to determine whether variance within each case judgment was normally distributed. Again, the majority of the cases met the homogeneity of variance assumption; however, several cases did not meet this assumption. Additional analyses were conducted to determine whether transforming the individual case judgments would improve this violation; however, no transformation included in SPSS was able to resolve all violations of the homogeneity of variance assumption. The final assumption, homogeneity of variance, is discussed in section 4.1. Mauchly's *W* was significant indicating that the data possessed significant differences in variance between the subject groups.

two assumptions have been met. The observations are independent and have been gathered from a number of organizations. Subjects were assigned to either the strong or weak case ordering by alternating subjects between the two orderings; while not completely random, subjects had an equal likelihood of receiving either ordering and were not aware of what order they did receive. Due to the high number of dependent variables and initial violations of the MANOVA assumptions, additional considerations were necessary regarding whether all of the individual cases should be included as dependent variables or if they should be reduced through principal component analysis.

4.2.1 Principal Component Analysis

The first step in evaluating whether principal component analysis is a possibility is to examine the correlations. The dependent variables should be moderately correlated with one another. The correlations of the individual case judgments as dependent variables can be seen in Appendix K. There are two tests that should be run prior to determining whether principal component analysis is appropriate for the data: Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) and Bartlett's Test of Sphericity. KMO determines whether the sample size is sufficient for principal component analysis. A minimum of 0.5 is suggested (Field 2009); the current study's KMO results were 0.720 indicating it was sufficient for data reduction by principal component analysis. The purpose of Bartlett's test is to determine whether the original correlation matrix was an identity matrix. For the purposes of Bartlett's test, the p-value should be significant to indicate there is some relationship between the dependent variables that were included. Bartlett's test was significant at a value of 0.000. Based on Bartlett's and KMO's results,

it appears that the data collected are sufficient for conducting principal components analysis to reduce the number of dependent variables included in the analyses.

Factors were extracted with a minimum eigenvalue of greater than 1. Eight factors were extracted explaining 76.7 percent of the variance. The total variance explained by each of the eight factors can be seen in Appendix L. The varimax factor loadings for each of the cases on the components can be seen in Table 12. The factor loadings were sorted by the items loading on each component. The cut-off point of 0.4, for inclusion in a component, was based on Stevens (2002) implication that factor loadings of greater than 0.4 represent substantial amounts.

	Varimax Rotated Factor Loadings							
	Primarily strong cases that lack Cue 6	**Cases with an equal distribution of controls between EEO and RFR**	**Strong cases with all RFR controls**	**Weak cases with Cue 1 and lacking Cues 3 and 4**	**Strong cases with an even distribution of controls between EEO and RFR**	**Weak case with only 1 RFR control in place**	**Strong cases with all RFR controls**	**No internal controls**
Case 29	0.792	-0.039	0.156	0.067	0.270	0.222	0.253	0.085
Case 26	0.791	-0.031	0.330	0.057	0.223	0.001	0.202	0.115
Case 23	0.730	0.044	0.342	0.002	0.442	0.157	-0.039	0.019
Case 32	0.709	0.349	-0.150	0.097	0.264	0.189	0.065	0.072
Case 16	0.694	0.418	-0.042	-0.002	0.260	0.248	-0.163	0.066
Case 28	0.609	0.440	0.071	0.355	-0.059	-0.077	0.040	-0.182
Case 2	0.547	0.253	-0.132	0.415	0.104	0.056	-0.321	0.276
Case 31	0.315	0.785	0.061	0.085	0.096	0.111	0.185	-0.015
Case 27	0.389	0.699	0.158	0.051	0.282	0.067	0.064	0.143
Case 6	-0.040	0.640	-0.038	0.278	0.163	0.080	-0.031	0.174
Case 5	0.102	0.616	0.491	-0.124	0.411	0.172	-0.058	0.022
Case 19	-0.071	0.604	-0.115	0.237	0.114	0.457	0.121	-0.074
Case 17	0.088	0.570	-0.077	0.472	0.269	0.347	-0.094	0.061
Case 10	0.446	0.484	-0.293	0.171	-0.030	0.217	-0.172	0.363
Case 9	0.369	0.470	-0.390	0.090	-0.019	0.294	0.020	0.469
Case 8	0.098	0.002	0.911	-0.049	-0.089	-0.027	0.056	-0.001
Case 20	0.146	-0.108	0.854	0.215	0.145	-0.111	0.105	0.008
Case 21	-0.052	0.337	0.552	0.116	-0.064	0.435	0.093	0.183
Case 4	0.249	-0.009	0.541	0.483	0.080	0.274	0.084	0.023
Case 1	0.079	0.184	-0.092	0.851	0.017	-0.160	0.063	0.076
Case 7	0.158	0.152	0.257	0.796	0.182	0.095	-0.054	0.097
Case 13	-0.013	0.086	0.361	0.633	0.184	0.324	0.204	0.048
Case 3	0.247	0.108	0.173	0.172	0.748	0.190	0.076	-0.035
Case 18	0.386	0.328	0.047	0.167	0.683	-0.068	0.109	-0.097
Case 24	0.361	0.230	-0.219	0.272	0.649	0.191	0.233	0.057
Case 14	0.273	0.454	-0.193	-0.016	0.572	0.159	-0.126	0.282
Case 25	0.165	0.095	0.021	-0.008	0.240	0.781	0.006	0.103
Case 15	0.344	0.399	-0.031	0.040	0.025	0.597	-0.128	0.090
Case 30	0.426	0.407	0.080	0.126	0.026	0.539	-0.056	-0.253
Case 22	0.182	0.095	0.047	0.017	0.201	0.002	0.808	-0.114
Case 12	-0.053	0.014	0.532	0.130	-0.097	-0.060	0.642	0.063
Case 11	0.082	0.099	0.161	0.146	0.015	0.028	-0.066	0.877
Eigenvalues	4.965	4.519	3.622	2.976	2.830	2.477	1.591	1.566
% of variance	15.516	14.122	11.319	9.300	8.844	7.740	4.973	4.894

Table 12. Component Factor Loading

Based on the component loading scores, new variables were created for each subject. The new variables represented a mean score of those cases loading highest with that component. Cases with ratings of greater than 0.4 on multiple components will be reviewed to determine whether their inclusion in the calculation of the mean dependent variable affects the overall results in Section 4.2.2. Those cases with multiple loadings of greater than 0.4 on multiple cases are indicated by a box surrounding the factor loadings in Table 12.

4.2.2 Test of Independent Variables Order and Role through a MANOVA

The assumptions of the MANOVA must be tested again using the new dependent variable created with principal component analysis. Multivariate normality cannot be tested with SPSS; however, the univariate for each dependent variable can be tested. Univariate normality was tested in two ways: visually through the review of histograms and through skewness and kurtosis values. While visually the histograms indicated the results were normally distributed, the z-scores for skewness indicated five of the eight components were skewed significantly to some degree, while only three were significant with regards to the kurtosis z-scores. The final assumption, homogeneity of covariance matrices, is tested through Box's test. Box's test was included in running the MANOVA; however, the p-value of 0.044 indicated that the dependent variables had failed the homogeneity of covariance test. The last two assumptions of the MANOVA have failed. Due to these failures, a non-parametric test, Kruskal-Wallis test, was run on the individual components to confirm the results found with the MANOVA discussed below. None of the individual components were significant by groupings.

The eight components[17] created with principal component analysis were included in the MANOVA as dependent variables; results from the MANOVA are shown in Table 13 below.

[17] Additional dependent variables were created to determine whether excluding cases with lower factor loadings on the components would impact the overall results. Initially cases with factor loadings of less than 0.6 were excluded from the calculation of the dependent mean variable. Results were similar in that there were no main effects or interactions and Box's test was still less than 0.05. Additionally, cases with factor loadings of less than 0.7 were excluded with similar results.

Additionally, those cases that loaded at greater than 0.4 on multiple components were excluded from the dependent mean variable calculation analysis to determine whether excluding these items from the mean would affect the results of the MANOVA. The findings were similar to those presented in Table 13 and Table 14.

Effect	Test	Value	F	Df		Sig.
				Hypothesis	Error	
Intercept	Pillai's Trace	0.988	502.517	8	48	0.000
	Wilks' Lambda	0.012	502.517	8	48	0.000
	Hotelling's Trace	83.753	502.517	8	48	0.000
	Roy's Largest Root	83.753	502.517	8	48	0.000
Order	Pillai's Trace	0.145	1.020	8	48	0.434
	Wilks' Lambda	0.855	1.020	8	48	0.434
	Hotelling's Trace	0.170	1.020	8	48	0.434
	Roy's Largest Root	0.170	1.020	8	48	0.434
Role	Pillai's Trace	0.132	0.914	8	48	0.513
	Wilks' Lambda	0.868	0.914	8	48	0.513
	Hotelling's Trace	0.152	0.914	8	48	0.513
	Roy's Largest Root	0.152	0.914	8	48	0.513
Order *	Pillai's Trace	0.170	1.225	8	48	0.305
Role	Wilks' Lambda	0.830	1.225	8	48	0.305
	Hotelling's Trace	0.204	1.225	8	48	0.305
	Roy's Largest Root	0.204	1.225	8	48	0.305

Table 13. MANOVA Results for SOX Internal Control Judgments[18]

Based on the p-values, no results were found to be significant for the main effects of order (H2), role (RQ1), or their interaction shown in Table 13. These findings indicate that, overall, auditors and management do not evaluate SOX internal control judgments differently. Additionally, the ordering of the cases received did not impact the judgment provided by subjects. Although there were no main effects when running the MANOVA, two components were significant for main effects.

[18] The results of the significance testing of the repeated measures mixed ANOVA between-subjects factors were reviewed and had similar findings. The main effects of order and role were not significant to the judgments provided by subjects and no interaction between the two existed at significant levels.

Additionally, the MANOVAs were rerun excluding all cases that loaded with greater than 0.4 on multiple components as designated in Table 12 with a box surrounding the multiple loadings. The results were still not significant with the smallest p-value being 0.273 for the case ordering. When excluding only those items with case loadings representing relatively similar low component loadings (Cases 4, 9, 10, 14, and 30), p-values increased and the main effects and interactions were still not significant.

4.2.3 Excluded Subjects and Covariates

Additional analyses were conducted to determine whether there were certain subsets within the sample that perhaps masked results that were statistically significant. The factors that were of particular interest were organization size and confidence level.

The implementation of SOX required a large number of individuals, auditors and management both, to gain an understanding of the effectiveness of the ICFR. As part of the demographic questions, subjects were asked to identify their confidence in their SOX knowledge level. A certain subset of the sample stated they had no confidence in their SOX knowledge. This lack of confidence could be indicative of their lack of exposure regarding SOX requirements and, therefore, be unrepresentative of those individuals making SOX judgments. In addition to evaluating the effect of SOX confidence level on SOX internal control judgments, other potential characteristics affecting judgment were explored. Those individuals indicating no confidence in their SOX knowledge were excluded from analyses.

Additional MANOVAs and MANCOVAs were run to determine whether there were other demographic characteristics that were related to differences in SOX judgments. A summary of the p-values for adjustments made to the original MANOVA (Table 13) can be seen in Table 14. The complete MANOVA, MANCOVA, and cell mean tables can be seen in Appendix M.[19, 20, 21, 22]

[19] Correlations were run for the covariate of organization size. There was a significant correlation for organization size with the independent variable of professional role. Only one case was found to have a significant correlation with the covariate of organization size.

[20] When organization size (categorical) was correlated with the independent variables, neither was significant. Two cases were found to be significantly correlated with the covariate.

[21] Correlations were run and determined that there was no significant correlation between the independent variables and the covariate of SOX confidence level. Correlations were also conducted to determine whether there was a significant correlation between the covariate and the dependent variables. None of the covariates correlated with the dependent variable by an absolute of greater than the value of 0.2

[22] Correlations were run and found no significant correlations between the covariance and independent variable of greater than 0.3 for the covariate of external audit experience. No significant correlations were found between the covariate and dependent variables of greater than 0.3.

Adjustment	p-value Order	Role	Order * Role
Organization Size			
MANCOVA, controlling for organization size (Table 34)	0.495	0.640	0.365
MANCOVA, controlling for organization size by categorical variable (Table 35)	0.401	0.596	0.312
MANOVA, excluding subjects from local firms (Table 36)	0.726	0.803	0.043
SOX Knowledge, Training, and External Audit Experience			
MANCOVA, controlling for SOX confidence (Table 38)	0.395	0.589	0.324
MANOVA, excluding subjects with no SOX training or non-response (Table 39)	0.348	0.552	0.221
MANOVA, excluding Management subjects with external audit experience	0.383	0.177	0.418
MANCOVA, controlling for Management subjects with external audit experience, dichotomous variable	0.508	0.885	0.457

Table 14. Summary of Adjustments to H2 and RQ1 MANOVA[23]

Organization size was controlled for in the analyses in three ways. The first method included a covariate for each level of organization: international, national, regional, and local (Table 34).[24] The second covariate split the organization size between international and national versus regional and local (Table 35). The final adjustment excluded all subjects employed with a local firm from analyses (Table 36). All three adjustments for organization size indicated an interaction existed for the subjects,

[23] The dependent variables excluding the cases with high component loadings on multiple cases had similar results to those above. The only significant finding was the interaction between role and order when excluding local subjects, as was the result above.

[24] Only four categories were included: international, national, regional, and local. "Big 4" auditors were included with the international organization size.

indicating all subjects were not equally susceptible to the impact of the case ordering received based on their organization size.

An additional covariate was incorporated into the analyses to understand the relationship of business experience to SOX judgments. Titles were not used due to the lack of comparability across management organizations.[25] Only when subjects that worked at a local organization were excluded from analyses were any results significant. The interaction between order and role became significant when local subjects were excluded. This finding was unhypothesized and will be studied in future research and could be related to the expected lack of experience with SOX.

One final concern related to individuals that were currently functioning in a management position but had previously worked in an external auditor capacity. This demographic information was incorporated into the analysis in two separate methods. The first adjustment excluded all management subjects with previous external audit experience (Table 41). This adjustment limited the management subject pool to only 11 subjects, and resulted in a p-value of approximately 0.177. This change in p-value could be due to the difference in group sizes between auditors and management subject pools, with 34 and 11, respectively. The second adjustment included external audit experience as a covariate in the MANOVA. A covariate was incorporated to determine whether holding the existence of experience constant was enough to create a difference between auditor and management groups (Table 43). Neither the exclusion of management

[25] Analyses were run regarding auditor title to determine whether the title affected the subjects' judgments. A MANCOVA was run with auditor titles as the covariates and no significance was found for the main effect of order. A MANOVA was run excluding all staff auditor subjects. No significance was found for the main effect of order.

subjects with external audit experience nor the incorporation of the external audit experience covariate resulted in a p-value of less than 0.10.

4.3 Hypothesis Three

Hypotheses 3a and 3b evaluate a subject's reliance on specific internal control objectives. This is tested by evaluating the objective reliance, or Beta coefficients, formed by regressing each case's cue responses to the subject's individual case judgment.

$$CaseJudgment = \beta_0 + \beta_i CN_i + \beta_j St + \beta_k Au + \beta_l (CN_i * St) + \beta_m (CN_i * Au) + \beta_n (St * Au) + \varepsilon \quad (1)$$

Where: *CaseJudgment* = Judgment of subject on an individual case
CN = Cue number
St = Case Order (0 = Weak, 1 = Strong)
Au = Management or Auditor subject (0 = Management, 1 = Auditor)

Each SOX judgment provided by the subject was used as an observation. Therefore, 32 SOX case judgments are included for each subject. Those case judgments were then regressed against each case's respective cues, found in Appendix E. Additionally, interaction variables were included to understand whether any cue was significant to one group or one ordering but not the other, as well as whether an interaction existed between the ordering and role variables.

Hypotheses 3a and 3b evaluated the reliance on cues by each profession. H3a expected that the predicted sign for each coefficient related to the interaction between the cue and the professional role would be positive for financial reliability related cues (1, 4, and 6), indicating that auditors relied more on those cues when providing judgments. H3b focused on management's reliance on cues when making judgments and expected

that the interaction coefficient for Cues 2, 3, and 5, effectiveness and efficiency of operations cues, would be negative, indicating that auditors rely less on those cues than the reference group (management). The findings indicated that of the role interaction variables incorporated into Equation 1 only one was significant at the p=0.05, as shown in Table 15. Two interactions, Cue 4 and Cue 5 were significant at p=0.10. Overall, auditor subjects relied on more cues to make their SOX internal control effectiveness judgments than their management counterparts. Similar differences can be seen when reviewing the subjects' subjective allocations indicating their reliance on the cues by professional role in Table 2. Auditors distributed their allocations more to effectiveness and efficiency of operations than did management. The role interactions indicate similar results with the two significant role interactions which show that auditors relied more on Cues 3 and 5 which were both effectiveness and efficiency of operations cues. All Equation 1 coefficients can be seen in Appendix N as well as the corresponding ANOVA table.

Variable	Predicted Sign	Beta	t	p-value
Cue 1 x Role	+	-0.154	-1.434	0.152
Cue 2 x Role	-	0.133	1.235	0.217
Cue 3 x Role	-	0.219	2.032	0.042
Cue 4 x Role	+	-0.208	-1.930	0.054
Cue 5 x Role	-	0.197	1.829	0.068
Cue 6 x Role	+	0.111	1.026	0.305

Table 15. Equation 1 Regression Predictions and Findings

Cues 3, 4, and 5 were significant when they were interacted with the role variable. When Cues 3 and 5 were interacted, auditors relied more upon these cues than did management; while Cue 4 was relied upon less by auditors. Cues 3 and 5 related to EEO. This interaction was unexpected and indicates that auditors are relying more on the EEO cues than management subjects. This finding is similar to auditors' and management's allocation of subjective reliance on the cues found in Table 2. While these findings are similar to the subjects' allocations, it is contrary to the expectation that auditors would establish a greater amount of their judgment on the reliability of financial reporting than on the effectiveness and efficiency of operations cues. This divergence from the anticipated results could be due to the differences in total business experience between the two subject groups. The management group has a mean experience of approximately 229.8 months experience, while auditors have only 81.3 months total experience. Increased experience could lead to a more refined knowledge structure (Choo and Trotman 1991; Libby and Frederick 1990); therefore, subjects could be expected to rely less on EEO cues when making SOX internal control effectiveness judgments with increased experience.

A second regression was conducted to test the reliance on a specific objective of the internal controls. The second regression simplified the cues into categories representing two of the objectives of internal controls as determined by COSO: effectiveness and efficiency of operations and reliability of financial reporting. The third objective, compliance with applicable laws and regulations, was excluded due to the expected difficulty in separating it from the reliability of financial reporting objective.

Dummy variables were created for each of the objectives of internal controls included in the cases. Dummy variables indicated if a specific internal control objective exists in each case.

$$CaseJudgment = \begin{matrix} \alpha_0 + \alpha_1 EEO + \alpha_2 RFR + \alpha_3 St + \alpha_4 Au + \alpha_5 (EEO * St) \\ + \alpha_6 (EEO * Au) + \alpha_7 (RFR * St) + \alpha_8 (RFR * Au) + \varepsilon \end{matrix} \quad (2)$$

Where: *CaseJudgment* = Judgment of subject on an individual case
EEO = Effectiveness and Efficiency Objective (0 = Does not exist, 1 = Existence)
RFR = Reliability of Financial Reporting (0 = Does not exist, 1 = Existence)
St = Case Order (0 = Weak, 1 = Strong)
Au = Management or Auditor subject (0 = Management, 1 = Auditor)

Findings indicated that there was no increased reliance on the cues based on the individual and their role when dummy variables for the control objective were incorporated into the regression equation. Based on these findings, auditors' and management's reliance on these objectives is not statistically significant, as shown in Table 16. All coefficients from Equation 2 and the related ANOVA can be found in Appendix N.

Variable	Predicted Sign	Beta	t	p-value
Reliability of Financial Reporting x Role	+	0.071	1.067	0.286
Effectiveness and Efficiency x Role	-	0.052	0.783	0.434

Table 16. Equation 2 Regression Predictions and Findings

Results on this regression equation may be due to the limited number of cases that do not contain at least one cue representing effectiveness and efficiency of operations or reliability of financial reporting.

In addition to regression analysis, cluster analysis was conducted to explore whether commonalities existed between individuals when similar judgments were provided on the SOX case judgments. Several methods of cluster analysis are available, but due to the limited subjects and uniformity of many of the variables, Hierarchical cluster analysis was used. The Hierarchical cluster analysis utilized the individual subjects as cases and their individual SOX case judgments as the dependent variables of interest. When SPSS was allowed to determine the appropriate number of clusters, only two clusters were formed. The subjects were split into two clusters of 58 subjects and one subject. The second cluster consisted of only one auditor who completed the weak manipulation of the instrument. After reviewing the judgments provided by this individual, the subject appeared to rate SOX judgments lower relative to their peers. When this subject was excluded from cluster analysis, clustering occurs with 54 subjects in one cluster and four subjects in cluster 2.

	Cluster 1		**Cluster 2**	
	Weak	**Strong**	**Weak**	**Strong**
Auditor	15	16	1	1
Management	13	10	1	1

Table 17. Cluster Analysis Groupings

Additional analyses were conducted to understand whether there were specific characteristics that might affect the judgments that were provided by subjects. The demographic information was chosen for its comparability between auditors and management. The selected statistics can be seen in Table 18.

	Cluster 1		Cluster 2	
	Auditor	**Management**	**Auditor**	**Management**
Organization Size				
Mean	1.55	2.0870	3.00	1.00
Minimum	1	1	2	1
Maximum	4	4	4	1
Std. Dev.	1.12	1.1246	1.41	0.00
SOX Confidence				
Mean	3.10	3.3	3.00	4.00
Minimum	2	2	2	4
Maximum	5	5	4	4
Std. Dev.	0.91	1.105	1.41	0.00
Total Experience				
Mean	80.06	221.87	123.50	321.00
Minimum	8	60	72	234
Maximum	480	648	175	408
Std. Dev.	86.01	135.92	72.83	123.04

Table 18. Cluster Demographics

Cluster 1 contained all but four subjects. The closer the organization size is to one, the larger the organization. For confidence in SOX knowledge, the closer this number is to five, the greater the confidence as self-reported by the subject. The subjects in cluster 2 have greater experience relative to their counterparts in cluster 1. However, with the limited subjects that did not cluster in cluster 1, it appears that the subjects are making relatively similar judgments. Particularly when SPSS was allowed to determine the

appropriate number of clusters, it determined only 2 clusters were necessary excluding only one subject. Cluster analysis corroborates the findings from the MANVOA that the judgments provided by subjects are not statistically different from one another.

Cluster analysis could provide valuable information regarding individuals that may be considered outliers and should be eliminated from analyses. The outlier previously determined was excluded from analysis and the repeated measures MANOVA was conducted again with results found in Table 19.

Effect	Test	Value	F	df		Sig.
				Hypothesis	Error	
Intercept	Pillai's Trace	0.988	497.786	8	47	0.000
	Wilks' Lambda	0.012	497.786	8	47	0.000
	Hotelling's Trace	84.730	497.786	8	47	0.000
	Roy's Largest Root	84.730	497.786	8	47	0.000
Order	Pillai's Trace	0.137	0.935	8	47	0.497
	Wilks' Lambda	0.863	0.935	8	47	0.497
	Hotelling's Trace	0.159	0.935	8	47	0.497
	Roy's Largest Root	0.159	0.935	8	47	0.497
Role	Pillai's Trace	0.123	0.824	8	47	0.585
	Wilks' Lambda	0.877	0.824	8	47	0.585
	Hotelling's Trace	0.140	0.824	8	47	0.585
	Roy's Largest Root	0.140	0.824	8	47	0.585
Order *	Pillai's Trace	0.159	1.108	8	47	0.375
Role	Wilks' Lambda	0.841	1.108	8	47	0.375
	Hotelling's Trace	0.189	1.108	8	47	0.375
	Roy's Largest Root	0.189	1.108	8	47	0.375

Table 19. MANOVA Results for SOX Internal Control Judgments, Excluding One Outlier Determined from Cluster Analysis

Eliminating this subject did not create any significant main or interaction effects. This subject remained in the full sample for all previously discussed analysis as their inclusion did not appear to affect the results significantly.

4.4 Additional Analyses

The study proposed four hypotheses and one research question. Based on the information collected, additional analysis was conducted to better understand the judgments made by auditors and management and the differences that exist in judgments between the two groups.

4.5.1 Self-Insight

Prior research studies (Ashton 1973, 1974b, 1974a; Trotman et al. 1983) have evaluated the self-insight of their subjects. Research has found differing results regarding the self-insight of the subjects when controlling for experience. Trotman et al (1983) found that increased experience led to increased self-insight. Each subject's case judgments were regressed to determine the Beta coefficients that indicate their objective reliance on the individual cues included in the cases. These coefficients were then correlated with their subjective judgments to understand whether significant differences exist between subjects. Additional information provided by their demographic information was included to understand whether specific attributes were significantly related to their self-insight.

Pearson correlations were conducted, correlating the subject's allocation of 100 points among the six cues to indicate their subjective reliance on the cues to their objective reliance on the cues.

		Alloc. Cue 1	Alloc. Cue 2	Alloc. Cue 3	Alloc. Cue 4	Alloc. Cue 5	Alloc. Cue 6
Beta Cue 1	**Correlation**	**0.617**	-0.022	-0.270	0.034	-0.335	-0.096
	p-value	**0.000**	0.868	0.039	0.801	0.010	0.470
Beta Cue 2	**Correlation**	-0.302	**0.265**	0.239	-0.214	0.291	-0.112
	p-value	0.020	**0.042**	0.069	0.103	0.025	0.400
Beta Cue 3	**Correlation**	-0.280	0.107	**0.350**	-0.257	0.186	0.013
	p-value	0.032	0.422	**0.007**	0.050	0.159	0.922
Beta Cue 4	**Correlation**	-0.025	-0.120	-0.041	**0.468**	-0.158	-0.246
	p-value	0.853	0.364	0.761	**0.000**	0.234	0.060
Beta Cue 5	**Correlation**	-0.255	0.166	0.128	-0.348	**0.456**	0.001
	p-value	0.051	0.208	0.334	0.007	**0.000**	0.993
Beta Cue 6	**Correlation**	-0.095	-0.159	-0.193	-0.016	-0.250	**0.646**
	p-value	0.476	0.228	0.143	0.903	0.056	**0.000**

Table 20. Correlations of Cue Allocations and Betas

The correlations that are of particular interest are those that fall along the diagonal, or the subjective and objective reliance on the same cue. This correlation suggests the subject's self-insight into their reliance on particular cues when making judgments. Complete correlation matrices can be found in Appendix O.

When correlations were calculated controlling for differences in total experience, as accounted for by a continuous variable, the correlations in Table 21 are relatively similar to that of the uncontrolled correlations found in Table 20 indicating that no significant differences in self-insight were found.

		Alloc. Cue 1	**Alloc. Cue 2**	**Alloc. Cue 3**	**Alloc. Cue 4**	**Alloc. Cue 5**	**Alloc. Cue 6**
Beta Cue 1	**Correlation**	**0.616**	-0.013	-0.267	0.022	-0.329	-0.093
	p-value	**0.000**	0.920	0.043	0.867	0.012	0.486
Beta Cue 2	**Correlation**	-0.299	**0.262**	0.237	-0.210	0.288	-0.114
	p-value	0.023	**0.047**	0.073	0.114	0.028	0.395
Beta Cue 3	**Correlation**	-0.282	0.106	**0.350**	-0.258	0.187	0.012
	p-value	0.032	0.429	**0.007**	0.050	0.159	0.926
Beta Cue 4	**Correlation**	-0.045	-0.108	-0.035	**0.459**	-0.139	-0.243
	p-value	0.739	0.418	0.793	**0.000**	0.299	0.066
Beta Cue 5	**Correlation**	-0.234	0.150	0.121	-0.331	**0.439**	-0.006
	p-value	0.077	0.262	0.364	0.011	**0.001**	0.966
Beta Cue 6	**Correlation**	-0.063	-0.188	-0.207	0.015	-0.302	**0.650**
	p-value	0.637	0.158	0.120	0.909	0.021	**0.000**

Table 21. Correlations of Cue Allocations and Betas, Controlling for Experience

Additionally, experience was controlled for by creating groupings of individuals with similar experience levels. Those groups were similar to the three most prevalent experience levels, or titles, within a public accounting firm: 0-24 months, 25-60 months, and greater than 60 months. The results are very similar to those found when correlations were not controlled for (Table 20) as well as when they were controlled for with a continuous variable (Table 21).

		Alloc. Cue 1	Alloc. Cue 2	Alloc. Cue 3	Alloc. Cue 4	Alloc. Cue 5	Alloc. Cue 6
Beta Cue 1	**Correlation**	**0.647**	0.031	-0.253	-0.016	-0.317	-0.098
	p-value	**0.000**	0.818	0.058	0.904	0.016	0.466
Beta Cue 2	**Correlation**	-0.295	**0.216**	0.210	-0.149	0.253	-0.108
	p-value	0.026	**0.107**	0.118	0.268	0.057	0.423
Beta Cue 3	**Correlation**	-0.273	0.084	**0.346**	-0.254	0.172	0.008
	p-value	0.040	0.537	**0.008**	0.057	0.201	0.955
Beta Cue 4	**Correlation**	-0.101	-0.062	-0.018	**0.463**	-0.117	-0.239
	p-value	0.453	0.645	0.896	**0.000**	0.387	0.074
Beta Cue 5	**Correlation**	-0.194	0.083	0.094	-0.302	**0.418**	-0.009
	p-value	0.148	0.541	0.485	0.022	**0.001**	0.945
Beta Cue 6	**Correlation**	-0.055	-0.212	-0.205	-0.006	-0.290	**0.641**
	p-value	0.683	0.114	0.127	0.965	0.028	**0.000**

Table 22. Correlations of Cue Allocations and Betas, Controlling for Experience with a Categorical Variable

Based on these findings, it does not appear that experience is a significant predictor of an individual's self-insight, regardless of whether experience measure was a continuous or categorical variable.

In addition to evaluating the self-insight relative when controlling for experience, the self-assessed confidence in SOX knowledge was incorporated as a control variable. The confidence in SOX knowledge variable was a self-assessed rating provided by the subjects. This rating was on a scale of 1 (Not at all confident) to 5 (Highly confident). Results of the correlation can be seen in Table 23.

		Alloc. Cue 1	Alloc. Cue 2	Alloc. Cue 3	Alloc. Cue 4	Alloc. Cue 5	Alloc. Cue 6
Beta Cue 1	**Correlation**	**0.626**	-0.038	-0.307	0.114	-0.402	-0.089
	p-value	**0.000**	0.776	0.019	0.395	0.002	0.508
Beta Cue 2	**Correlation**	-0.301	**0.267**	0.242	-0.229	0.300	-0.113
	p-value	0.022	**0.043**	0.067	0.084	0.022	0.400
Beta Cue 3	**Correlation**	-0.295	0.099	**0.341**	-0.222	0.160	0.020
	p-value	0.025	0.461	**0.009**	0.095	0.229	0.881
Beta Cue 4	**Correlation**	-0.015	-0.112	-0.024	**0.442**	-0.130	-0.258
	p-value	0.914	0.401	0.856	**0.001**	0.330	0.050
Beta Cue 5	**Correlation**	-0.259	0.164	0.124	-0.347	**0.454**	0.003
	p-value	0.050	0.219	0.355	0.008	**0.000**	0.981
Beta Cue 6	**Correlation**	-0.097	-0.161	-0.197	-0.008	-0.259	**0.648**
	p-value	0.471	0.227	0.139	0.950	0.049	**0.000**

Table 23. Correlations of Cue Allocations and Betas, Controlling for Self-Assessed Confidence in SOX Knowledge

There were mixed results when self-assessed confidence in SOX knowledge was included as a control variable. Three correlations decreased (Cues 3, 4, and 5), while three increased (Cues 1, 2, and 6). These changes are not related to whether the objective of the cue was the effectiveness and efficiency of operations or reliability of financial statements. The inconsistencies in the findings indicate that subjects may have greater self-insight relative to certain aspects of internal control effectiveness judgments.

4.5.2 Higher-Level Cue Interactions in Regression Equations

Additional analyses were conducted to understand whether there were additional interactions with the cues on the judgments provided by the subjects. Initial analysis was conducted using each subject's 32 SOX judgments as an observation, creating 2,208 observations. All main effects and two- through six-way interactions of the internal control cues were included in the regression. No variables were included for the ordering

of the cases or subject profession. When all internal control cue interactions were included, only four main effects (Internal Control Cues 1, 2, 4, and 5) and one interaction (Cue 5 x Cue 6) were found to be significant at p-value<.05. One main effect (Cue 3) and one interaction (Cue 1 x Cue 4) were found to be significant at the p-value of less than 0.10.

The data file was then split to analyze whether auditors and managers overall rely differently on the internal control cues, including all main effects and interaction effects.

	Auditors	**Management**	**Overall**
Main Effects			
p value < 0.05	3	3	4
p value < 0.10	1	0	1
Two-way interactions			
p value < 0.05	1	1	1
p value < 0.10	0	0	1
Three-way interactions			
p value < 0.05	0	0	0
p value < 0.10	0	0	1
Four-way interactions			
p value < 0.05	0	0	0
p value < 0.10	0	0	0
Five-way interactions			
p value < 0.05	0	0	0
p value < 0.10	0	0	0
Six-way interactions			
p value < 0.05	0	0	0
p value < 0.10	0	0	1
Adjusted R^2	**0.501**	**0.553**	**0.520**

Table 24. Main Effects and Interactions by Subject Group

The interaction between internal control Cues 1, 2 and 6 was the only three-way interaction that explained significant variance at the p-value<0.10 for auditor subjects.

Five-way interactions were highly unlikely due to there being a single case where a five-way interaction was possible. This is due to the research design with each case having two, four, or six "Yes" responses. There is only one case per ordering that would have "Yes" to all five internal control cues: Case 11 (Strong) or Case 22 (Weak). All coefficients of variables included in the final regression equations can be seen in Appendix P.

As the research design allows for testing of all main effects and two-way interactions, the previous regressions were run again to determine whether the exclusion of the higher order interactions provided additional variance explanation.

	Auditors	**Management**	**Overall**
Main Effects			
p value < 0.05	3	3	5
p value < 0.10	1	1	0
Two-way interactions			
p value < 0.05	4	4	4
p value < 0.10	0	2	1
Adjusted R^2	**0.501**	**0.555**	**0.518**

Table 25. Main Effects and Two-Way Interactions by Subject Group

While Cue 6 was not a main effect when it was regressed, three of the Cue 6 interactions (C1xC6, C4xC6, and C5xC6) were significant at the p-value < 0.05 level when subject group was not considered. One additional two-way interaction was significant at the p-value < 0.5, C1xC4, for both auditors and management.

Finally, the file was analyzed by subject to determine whether two-way interactions were more common when analyzing individual subject's judgments. Three-way interactions and higher were excluded from the analyses at this point, due to the limited observations available. Table 26 reports the findings of main effects and two-way interactions for the internal control cues when each subject's judgments are regressed against their SOX judgments.

	Significant at p-value < 0.01	**Significant at p-value < 0.05**	**Significant at p-value < 0.10**
Cue1	41	9	1
Cue2	9	7	2
Cue3	10	9	6
Cue4	49	4	1
Cue5	14	8	5
Cue6	43	7	5
C1xC2	0	1	3
C1xC3	0	1	3
C1xC4	9	8	2
C1xC5	0	0	7
C1xC6	3	6	8
C2xC3	0	0	4
C2xC4	0	2	0
C2xC5	0	2	3
C2xC6	1	2	4
C3xC4	0	2	4
C3xC5	1	0	5
C3xC6	0	1	2
C4xC5	0	3	1
C4xC6	4	11	9
C5xC6	1	1	2

Table 26. Main Effects and Interactions, when Evaluated by Subject

Main effects for Internal Control Cue 6 were excluded from the final regression equation for all subjects due to the high colinearity that was found between it and the other internal control cues and interactions.

CHAPTER 5
IMPLICATIONS, DISCUSSION, AND LIMITATIONS

5.1 Implications and Discussion

This study represents an initial endeavor at exploring the differences in auditors' and management's internal control effectiveness judgments. Prior studies have evaluated the internal control effectiveness judgments by auditors, but the implementation of SOX has required both auditors and management to have a greater understanding of the internal control judgments. The current study had explored whether the differences between the two groups' judgments were statistically different but found no results, indicating that the two groups do not provide statistically significant different internal control effectiveness judgments.

This study has implications for both practice and academics. Future studies should seek to confirm the results found in the current study. Based on the use of principal component analysis, generalizations should be limited to the sample tested here. The confirmation of these findings in future studies should provide auditors and the PCAOB with some level of comfort that, when provided the same information, auditors and management are capable of making judgments that are not statistically different from the other group as shown in Table 13. AS5 encouraged auditors to rely more on the work of others. The lack of significant differences between auditors and management should provide limited comfort that given similar information the groups' judgments will not

differ greatly overall. It has been suggested that management is the first mover in internal control Section 404 judgments and influences the judgments provided by auditors (Earley et al. 2008). The management and auditor subjects in the current study did not have statistically different judgments when asked to provide their judgments in isolation.

Based on the current study's results, the groups were also not affected by the order of cases they received. This lack of a recency effect is valuable information when considered in conjunction with the accelerated time frame the SEC has enacted for all public companies. With the accelerated time frame, organizations must file sooner than they had previously, requiring auditors to evaluate greater information in a relatively shorter period of time.

In addition to looking at the main effects and interaction of professional role and case ordering, the individual cues were investigated to determine whether subjects relied differently on the cues when providing their internal control effectiveness judgments. Cues related to the reliability of financial reporting were the cues most heavily relied upon by subjects as shown in Table 44 on page 125. Beta coefficients for cues related to the reliability of financial reporting were twice the size of those related to effectiveness and efficiency of operations. While it was expected in H3a and H3b that subjects would rely differently on cues based on their role, results were significantly different between auditors and management on three cues, as seen in Table 15 (page 68) and Table 44 (page 125). Based on the objective reliance, as indicated by the Beta coefficients, auditors placed greater reliance on Cues 3 and 5 relative to management and less reliance

on Cue 4. These findings indicated that auditor subjects distributed their judgment between greater variables than did management. Additionally, these findings may indicate that auditor subjects were incorporating extraneous information into their SOX internal control effectiveness judgments. Findings did indicate that subjects' objective cue reliance was affected by the order of cases that they received for Cue 3 only.

Self-insight was explored to understand the relationship between subjective and objective cue reliance. Subjects were able to identify their relative reliance of each of the cues, as all p-values of the correlations are less than 0.05 (Table 44, page 125). However, subjects possessed strong self-insight into two of the three cues they relied upon most when providing internal control effectiveness judgments. Reviewing the Beta coefficients (Table 44, page 125), the three cues that were most heavily relied upon when providing internal control effectiveness judgments were Cues 1, 4, and 6. The cues with the strongest correlations between the objective and subjective reliance were Cues 1 and 6 with correlations of 0.617 and 0.646 (Table 48, page 75), respectively.

5.2 Limitations

Several limitations exist with the current study. The first of those limitations is the lack of realism to the task. The information provided to the subjects has been simplified significantly from what is available to subjects in reality. The task has simplified the information to six cues. In reality, subjects would have daily interactions, historical information, and a multitude of other information to incorporate in their internal controls evaluations.

The second considerable limitation of the study is due to the subjects involved in the study. Due to the considerable time requirements necessary to complete the instrument, the subjects that were able to complete the instrument were limited. A number of methods were used to try and attract subjects to complete the study, including CPE programs, direct contact with firms, and alumni advisory boards. Due to the length of the study and the specialization preferred, the availability of subjects was limited. Based on this limitation, there are fewer subjects than would have been preferred in the final sample. Additionally, some of the subjects that completed the instrument were from smaller auditing firms and corporations. These smaller corporations and auditing firms are not necessarily required to follow SOX. It is unlikely that these excluded subjects would be as familiar with the SOX internal control effectiveness judgment process that was being assessed in the study and potentially provide significantly different judgments than those familiar with the process. Feedback from some subjects indicated that the task took far longer than they had anticipated. Those same individuals also indicated that they had not completely read the instructions that indicated the cue ordering or the judgments did not change throughout the instrument. This problem may have been prevalent in the sample as indicated by the high response time necessary for subjects to complete the instrument.

Additionally, the research design provides a limitation. The difficulty of testing for main and interaction effects using repeated measures limits the cues to a select few so that all main effects and two-way interactions can be tested. Due to the research design, a half replication of the 64 possible combinations of internal cue responses, higher level

interactions may not be appropriately measured. However, a full replication of the current instrument would have been too time consuming for individuals to complete and would have likely yielded far fewer responses than the current study. Higher level cue interactions were not found to be significant when additional analyses were conducted. This implies that subjects did not consider the responses of multiple cues when providing internal control judgments. Future studies should consider limiting the information available to subjects to have a better understanding of the information that subjects are using to make internal control effectiveness judgments.

A final limitation of the study is the analyses of the data. Due to the violations of assumptions necessary for ANOVAs and MANOVAs and the incorporation of principal components analysis, generalizations that are made should be limited to the sample tested in this study. Until the results of this study have been confirmed on an additional sample, researchers should be cautious regarding the generalizations they draw from the study. A number of methods were used to corroborate the results that were found in the MANOVA including a repeated measures mixed ANOVA, cluster analysis, and Kruskal-Wallis, a non-parametric test. The results all indicated that subjects did not provide statistically significant different judgments in relation to the SOX internal control effectiveness judgments. While overall the judgments were not significantly different, the two subject groups did rely on varying cues when making those judgments.

There are several directions that future research can take. The first could be utilizing the same instrument included here but manipulating the narrative information provided to the subjects. For instance, management compensation has been shown to

influence auditors' assessments of audit risk (Dikolli et al. 2004). Additionally, the current study shows increasing revenues and income. Would providing the subjects with a narrative that shows decreasing revenues and income alter the subjects' effectiveness judgments? In addition to manipulating the information included in the narrative, anchoring could be explored to understand if giving the management's judgment to the auditor prior to evaluating the relevant information influences the auditor's judgment.

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APPENDIX A – Recruitment Letter

You have been selected as a potential subject in a research study. The purpose of this project is to gather information about the internal control judgment process. The success of this project depends on the use of your professional judgment. This study should take approximately 15 to 25 minutes of your time and can be completed at a location and time of your choosing.

Participation in this study requires you to evaluate Acme, Inc.'s internal controls over inventory. You will be asked a series of questions related to Acme and your professional experience. Individual responses will be strictly confidential. All responses will be analyzed only after being combined with the responses of other participants and results will be reported only in the aggregate.

The information you will receive about Acme is not intended to fully represent what would be available during a detailed internal controls evaluation. Nevertheless, please base your professional opinions only on the information provided.

To participate in the study, please click on the link below.

http://hokieaccounting.com/survey/a [http://hokieaccounting.com/survey/m]

If you would like to receive a summary of the results from this study, please email me at the address below.

Thank you again for your time.

Suzanne M. Seymoure

Virginia Tech

Seymoure@vt.edu

APPENDIX B – Study Introduction and Instructions

INTRODUCTION

Thank you for agreeing to participate in this research study. The purpose of this project is to gather information about the internal control judgment process. The success of this project depends on the use of your professional judgment. This study should take approximately 15 to 25 minutes of your time.

Participation in this study requires you to evaluate Acme, Inc.'s internal controls over inventory. You will be asked a series of questions related to your evaluation and your professional experience. Your individual responses will be strictly confidential and you may withdraw from the study at anytime. Your responses will be analyzed only after being combined with the responses of other participants and results will be reported only in the aggregate.

The information you will receive about Acme is not intended to fully represent what would be available to you during a detailed internal controls evaluation. Nevertheless, please base your judgments only on the information provided. There are no "correct" answers to the cases, just professional opinions.

You are free to withdraw from the study at any point by clicking the "Exit Survey" button in the upper right hand corner of the screen.

Please do not discuss these materials with others while you are completing the case. If you would like to receive a summary of the results from this study, please email me at the address below.

Thank you again for your participation.

Suzanne M. Seymoure

Virginia Tech

Seymoure@vt.edu

CASE INSTRUCTIONS (Auditors)

You are the auditor in charge of the year-end audit for Acme, Inc. The purpose of your audit is to issue standard audit and internal control reports. Your firm has performed the annual audit for the past several years, but this is the first year you are in charge of the fieldwork. You have been asked to provide three ratings on the internal controls related to the effectiveness and efficiency of operations, reliability of financial reporting, and the Sarbanes-Oxley required evaluation. Your firm issued an unqualified audit and internal control opinion last year.

Effectiveness and efficiency of operations refers to the organization's ability to meet basic business objectives, including performance goals and safeguarding of resources.

Reliability of financial reporting relates to the reliability of the published financial statements, including both interim and condensed financial statements and any information derived from those statements, including earnings releases.

The Sarbanes-Oxley required evaluation refers to the annual assessment of the effectiveness of internal controls over financial reporting.

CASE INSTRUCTIONS (Managers)

You have been asked to conduct the evaluation of the effectiveness of the internal controls in place for inventory for the management requirements of the Sarbanes-Oxley Act. You have been asked to provide three ratings of the internal controls as related to the effectiveness and efficiency of operations, reliability of financial reporting, and the Sarbanes-Oxley required evaluation. An unqualified audit and internal control opinion was issued last year by your external auditors.

Effectiveness and efficiency of operations refers to the organization's ability to meet basic business objectives, including performance goals and safeguarding of resources.

Reliability of financial reporting relates to the reliability of the published financial statements, including both interim and condensed financial statements and any information derived from those statements, including earnings releases.

The Sarbanes-Oxley required evaluation refers to the annual assessment of the effectiveness of internal controls over financial reporting.

COMPANY INFORMATION

Acme, Inc. is a diversified, publicly-held company with approximately 28.1 million shares outstanding. During the year under review, revenues were about $591.7 million, an increase of $87.7 million over the previous year. Net income was about $40.6 million, an increase of $8.0 million over the previous year. Inventory at year-end was $109.0 million, an increase of $13.2 million over the previous year. Total assets at year-end were $440.8 million, an increase of $78.6 million.

As part of the annual audit, you are conducting an audit of the effectiveness of internal controls as required by the Sarbanes-Oxley Act. In this experiment, you are concerned only with the internal controls over inventory. Other members of the audit team will be making judgments regarding the effectiveness of the other internal controls.

INSTRUCTIONS

For the purpose of your evaluation of internal controls, you have asked your associate to look at six internal controls related to inventory. Each internal control is stated in the form of a statement. Your associate has indicated whether the control exists by placing an X in the Yes column if the control was in place, or the No column if the control was not in place. Based on these six indicators, you will make a judgment regarding the strength of the internal controls. The wording and order of the indicators does not change throughout the thirty-two cases. After considering these six indicators, you will rate the strength of the internal controls over inventory on a scale of 1 (extremely weak) to 7 (strong). Cues or their order do not change throughout the cases. Consider each case independently.

In the experiment you are asked to rate 32 cases. You should indicate your rating by selecting the appropriate number on the scale from 1 to 7. To become familiar with this rating task, the first 4 cases are for “practice.” You may wish to respond to all of the practice cases, or only some of them, before responding to the 32 cases which follow.

Once you have completed all of the cases, you will be asked for some additional information surrounding the internal controls and your professional background.

APPENDIX C – Practice Case 1

		Yes	No
1.	Any adjustment to the price or quantity of inventory is related to an actual change in price or physical inventory difference.	X	
2.	Lead time is known for customer deliveries or to replenish inventory stock.	X	
3.	All supply chain processes have been mapped to identify value-added and non-value added activities, bottlenecks, cycle time, etc.		X
4.	Any adjustment to the price or quantity of inventory is recorded.		X
5.	A quality control process is in place for reviewing inventory prior to distribution to the client.	X	
6.	Products returned by the customer are accurately recorded in the correct period.		X

Please circle your overall rating of the inventory internal control structure

Extremely Weak	Very Weak	Substantial Weakness	Some Weakness	Not Quite Adequate	Adequate	Strong
1	2	3	4	5	6	7

APPENDIX D – Previously Utilized Cues

Ashton (1973, 1974a, 1974b) and Ashton and Kramer (1980) Cues

1. Are the tasks of both timekeeping and payment of employees adequately separated from the task of payroll preparation?
2. Are the tasks of both payroll preparation and payment of employees adequately separated from the task of payroll bank account reconciliation?
3. Are the names on the payroll checked periodically against the active employee file of the personnel department?
4. Are formal procedures established for changing names on the payroll, pay rates, and deductions?
5. Is the payroll audited periodically by internal auditors?
6. Was the internal control over payroll found to be satisfactory during the previous audit?

Ashton and Brown (1980) Cues

1. Are the tasks of both timekeeping and payment of employees adequately separated from the task of payroll preparation?
2. Are the tasks of both payroll preparation and payment of employees adequately separated from the task of payroll bank account reconciliation?
3. Are the names on the payroll checked periodically against the active employee file of the personnel department?
4. Are formal procedures established for changing names on the payroll, pay rates, and deductions?
5. Is the payroll audited periodically by internal auditors?
6. Was the internal control over payroll found to be satisfactory during the previous audit?
7. Are the duties of those preparing payroll rotated?
8. In hiring new employees, is an inquiry made as to his/her background and former employers?

Hamilton and Wright (1982) Cues

1. Is the task of timekeeping adequately separated from the task of payroll preparation?

2. Is the task of payroll preparation adequately separated from the task of payroll bank account reconciliation?

3. Is the task of payment of employees adequately separated from the tasks of timekeeping and payroll bank account reconciliation?

4. Are formal procedures established for changing names on the payroll, pay rates, and deductions?

5. Did internal auditors audit the payroll during the audit period?

Trotman et al. (1983) Cues

1. Are the names on the payroll checked periodically against the active employee file of the personnel department?

2. Do personnel records contain signatures of employees?

3. Are unclaimed wages returned to the cashier or a department other than payroll?

4. Are the tasks of both timekeeping and payment of employees adequately separated from task of payroll preparation?

5. Is the payroll audited periodically for changing names on the payroll, pay rates, and deductions?

6. Are formal procedures established for changing names on the payroll, pay rates, and deductions?

7. Are the tasks of both payroll preparation and payment of employees adequately separated from the task of payroll bank reconciliation?

8. Was the internal control over payroll found to be satisfactory during the previous audit?

9. In hiring new employees, is an inquiry made as to his/her background and former employers?

10. Are the duties of those preparing the payroll rotated?

APPENDIX E – Case Orderings

Case Number	Weak Case Order						Strong Case Order					
	Cue Numbers						Cue Numbers					
	1	2	3	4	5	6	1	2	3	4	5	6
1	Y	N	N	N	Y	N	Y	Y	Y	N	Y	N
2	N	Y	Y	N	N	N	N	N	Y	Y	Y	Y
3	Y	Y	Y	N	N	Y	N	N	Y	Y	N	N
4	Y	N	N	Y	N	N	Y	N	Y	Y	Y	N
5	N	Y	Y	Y	N	Y	N	N	N	Y	Y	N
6	N	N	N	N	Y	Y	N	Y	N	Y	Y	Y
7	Y	Y	N	N	N	N	Y	Y	N	Y	Y	N
8	Y	Y	N	Y	N	Y	Y	N	Y	N	N	N
9	N	N	Y	N	Y	N	Y	N	Y	N	Y	Y
10	N	Y	N	N	Y	N	Y	Y	Y	Y	N	N
11	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y
12	Y	N	N	Y	Y	Y	N	N	N	Y	N	Y
13	Y	N	N	N	N	Y	Y	N	Y	Y	N	Y
14	N	Y	Y	N	Y	Y	N	Y	N	N	N	Y
15	N	Y	N	Y	N	N	Y	Y	N	N	Y	Y
16	N	Y	Y	Y	Y	N	N	N	Y	N	N	Y
17	N	N	Y	N	N	Y	N	Y	Y	Y	Y	N
18	Y	Y	N	N	Y	Y	N	Y	N	Y	N	N
19	N	Y	N	N	N	Y	N	Y	Y	N	Y	Y
20	Y	N	Y	Y	N	Y	Y	N	N	N	N	Y
21	N	N	N	Y	N	Y	Y	N	N	Y	Y	Y
22	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N
23	Y	Y	Y	Y	N	N	N	Y	N	N	Y	N
24	Y	N	Y	N	Y	Y	N	N	Y	N	Y	N
25	Y	N	Y	N	N	N	Y	Y	N	Y	N	Y
26	Y	Y	N	Y	Y	N	Y	Y	N	N	N	N
27	N	Y	N	Y	Y	Y	N	N	N	N	Y	Y
28	N	N	N	Y	Y	N	N	Y	Y	Y	N	Y
29	Y	N	Y	Y	Y	N	Y	N	N	Y	N	N
30	N	N	Y	Y	N	N	Y	Y	Y	N	N	Y
31	N	N	Y	Y	Y	Y	N	Y	Y	N	N	N
32	Y	Y	Y	N	Y	N	Y	N	N	N	Y	N

APPENDIX F – Additional Information (Management Responses)[26]

Are there additional controls you would have preferred to know about to make your judgment, other than the six controls included in the checklist?

- Cycle count procedures
- No real discussion of inventory costing (WIP, flow etc) - first control only speaks to change in price or physical difference. Without clearer understanding of the full range of the inventory process difficult to make a judgment.
- Orders are valid and come from a separate sales department. Inventory is taken manually and compared to a perpetual system. Inventory is secured physically.
- I would want to understand the separation of duties surrounding recording inventory transactions.
- What ensures that inventory subledgers agree to the general ledger? What ensures that production activity (raw materials to work-in-progress to finished goods) is properly recorded? What ensures that perpetual records properly reflect quantities and amounts?
- Segregation of duties regarding discovering inventory adjustments and actually making them Are returns logged when they come in Are inventory adjustments reported and reviewed
- Type of inventory taken.. ie weighted cycle counts vs annual 1 time
- Yes - how good are entity-level controls, review and monitoring by upper management
- Access to inventory reviews (are keys required to access inventory, if so, does someone review the listing of those with access to ensure they all have an adequate business need for access) - Segregation of duties (responsibilities related to booking inventory vs. access to inventory) - Is there a secondary review (is there only one individual that counts the inventory, or is there a second count performed by someone else) - Who is responsible for the depreciation of inventory (is inventory being depreciated accurately) - Were all site locations reviewed for existence (or completeness if the company is trying to make their financials look less appealing in order to obtain a loan, for example) - What about Work in Process (WIP) (how is this reviewed, calculated, and booked)
- Variance analysis performed between actual, budgeted and prior period results. Inventory adjustments- physical count vs Trial Balance. Receiving and shipping controls
- Was a physical inventory conducted? was estimation sampling or cycle counting performed? is a reconciliation of physical inventory to perpetual inventory records performed? where is the inventory held? what type of security or physical controls exist?
- How effective their controls and processes around their physical inventory were

[26] These represent unedited responses by management subjects.

- More specific information regarding inventory valuation, industry standard inventory practices, management approval levels of inventory adjustments

Is there additional information you would have liked to receive regarding Acme, Inc.?

- Reasoning my subordinate used to come to his conclusions...why they thought that Acme did or did not have quality controls.
- Type of inventory
- Though some data sizing was presented, none of the controls had any quantitative elements (e.g. are customer returns common in the industry or circumstances)
- Whether they use the LCM
- What is the dollar value of the average inventory item What percentage of items are returned How is inventory relieved
- Is the inventory perishable or not
- How financial information is recorded- type of ERP or acctg system. Results of past SOX testing-any material weaknesses found. Tone at the top and other entity level controls that could override these controls. No information was provided on governmental and regulatory controls.
- What industry is Acme in? what is the nature of the inventory (kind of product)?
- How important their inventory balance was, in relation to the company's overall financial and operational picture

APPENDIX G – Additional information (Auditor Responses)[27]

Are there additional controls you would have preferred to know about to make your judgment, other than the six controls included in the checklist?

- Yes, I would have wondered about the following 2 additional controls. 1) Controls around the frequency of physical counts and cycles counts which would identify adjustments. 2) Controls surrounding periodic evaluation of obsolescence/valuation of inventory.
- How often are physical inventories performed? Controls surrounding the receiving and shipping of inventory. Controls over the safe guarding of inventory.
- Whether there are regular physical inventory or cycle counts; is there a regular review of actual to budget perform as part of a high lever review by management; Average amount of customer returns; physical/security controls.
- Actual Physical inventory count prior to reporting period. Periodic review of standards (assumed used standard costing). Review of significant changes at count, or other adjustments. Review of orders received/sent.
- - Controls related to rights & obligations (i.e., changes in inventory were recorded, but was the inventory actually ours?) - Controls related to p&d (i.e., costing methodology - FIFO, ave cost, etc.) - Controls related to obsolescence
- Independent review of physical count and distribution
- Physical Access controls over inventory

Is there additional information you would have liked to receive regarding Acme, Inc.?

- Yes, the size of the management group and the levels of the individuals performing the controls.
- To determine the $109.0 million inventory balance, was this amount a result of a physical inventory taken or based solely on purchase price of the materials? If a physical inventory was taken, what was the adjustment, if any, from the amount recorded in the ledger versus the actual inventory count?
- What industry do they operate in? Is their inventory easily stolen? Can the inventory easily become obsolete?
- Comparison of Peers
- Type of industry (i.e., manufacturer, wholesaler, etc.) Type of inventory (i.e., commodity, perishable, etc.) Annual $ of customer returns. (i.e. was proper period recording of returns really material to financial reporting). This would have affected my conclusions in possibly all 3 categories.
- Are they on a periodic or perpetual inventory system?
- Any risk areas? Have they been through readiness? If so, what were the areas that they had to fix after this assessment?

[27] These represent unedited responses by auditor subjects.

APPENDIX H – Cue Reliance

Now that you have completed ratings of the thirty-two cases, please allocate 100 points to the 6 internal control questions to indicate the relative importance of each question. The questions that are more important should be assigned more points than the less important questions, and the total should equal 100 points.

		Points
1.	Any adjustment to the price or quantity of inventory is related to an actual change in price or physical inventory difference.	
2.	Lead time is known for customer deliveries or to replenish inventory stock.	
3.	All supply chain processes have been mapped to identify value-added and non-value added activities, bottlenecks, cycle time, etc.	
4.	Any adjustment to the price or quantity of inventory is recorded.	
5.	A quality control process is in place for reviewing inventory prior to distribution to the client.	
6.	Products returned by the customer are accurately recorded in the correct period.	
	Total	**100**

APPENDIX I – Levene's Equality of Variance by Individual Case

	F	df1	df2	p-value	
Case 1 SOX Judgment	4.306	3	55	0.008	*
Case 2 SOX Judgment	0.065	3	55	0.978	
Case 3 SOX Judgment	0.249	3	55	0.862	
Case 4 SOX Judgment	0.636	3	55	0.595	
Case 5 SOX Judgment	1.155	3	55	0.335	
Case 6 SOX Judgment	0.820	3	55	0.489	
Case 7 SOX Judgment	0.595	3	55	0.621	
Case 8 SOX Judgment	1.537	3	55	0.215	
Case 9 SOX Judgment	2.415	3	55	0.076	**
Case 10 SOX Judgment	0.157	3	55	0.925	
Case 11 SOX Judgment	4.788	3	55	0.005	*
Case 12 SOX Judgment	2.344	3	55	0.083	**
Case 13 SOX Judgment	2.940	3	55	0.041	*
Case 14 SOX Judgment	0.937	3	55	0.429	
Case 15 SOX Judgment	0.902	3	55	0.446	
Case 16 SOX Judgment	0.806	3	55	0.496	
Case 17 SOX Judgment	0.950	3	55	0.423	
Case 18 SOX Judgment	3.948	3	55	0.013	*
Case 19 SOX Judgment	0.345	3	55	0.793	
Case 20 SOX Judgment	0.721	3	55	0.544	
Case 21 SOX Judgment	1.868	3	55	0.146	
Case 22 SOX Judgment	0.229	3	55	0.876	
Case 23 SOX Judgment	0.381	3	55	0.767	
Case 24 SOX Judgment	0.867	3	55	0.464	
Case 25 SOX Judgment	0.434	3	55	0.729	
Case 26 SOX Judgment	0.299	3	55	0.826	
Case 27 SOX Judgment	0.703	3	55	0.554	
Case 28 SOX Judgment	0.513	3	55	0.675	
Case 29 SOX Judgment	0.643	3	55	0.591	
Case 30 SOX Judgment	1.184	3	55	0.324	
Case 31 SOX Judgment	1.335	3	55	0.272	
Case 32 SOX Judgment	1.999	3	55	0.125	

Table 27. Levene's Equality of Variance by Individual SOX Case Judgment

* Significant at the $p<0.05$ level.
** Significant at the $p<0.10$ level.

APPENDIX J – Overall SOX Case Judgments

	Min.	Max.	Mean	Median	Std. Dev.
Case 1 SOX Judgment	1	5	2.203	2	0.906
Case 2 SOX Judgment	1	4	1.847	2	0.805
Case 3 SOX Judgment	1	6	3.864	4	1.266
Case 4 SOX Judgment	1	6	3.254	3	1.254
Case 5 SOX Judgment	1	7	3.831	4	1.206
Case 6 SOX Judgment	1	6	2.475	2	1.023
Case 7 SOX Judgment	1	4	2.254	2	0.843
Case 8 SOX Judgment	1	7	5.186	6	1.468
Case 9 SOX Judgment	1	6	2.051	2	1.224
Case 10 SOX Judgment	1	6	2.034	2	1.129
Case 11 SOX Judgment	1	3	1.102	1	0.357
Case 12 SOX Judgment	1	7	5.559	6	1.277
Case 13 SOX Judgment	1	7	3.068	3	1.350
Case 14 SOX Judgment	1	6	3.102	3	1.528
Case 15 SOX Judgment	1	5	2.508	2	0.954
Case 16 SOX Judgment	1	6	3.051	3	1.370
Case 17 SOX Judgment	1	5	2.220	2	0.984
Case 18 SOX Judgment	2	6	3.593	3	1.275
Case 19 SOX Judgment	1	5	2.254	2	0.975
Case 20 SOX Judgment	1	7	5.339	6	1.409
Case 21 SOX Judgment	1	6	3.288	3	1.415
Case 22 SOX Judgment	4	7	6.542	7	0.597
Case 23 SOX Judgment	1	7	4.085	4	1.277
Case 24 SOX Judgment	2	6	3.932	4	1.127
Case 25 SOX Judgment	1	6	2.424	2	0.969
Case 26 SOX Judgment	2	6	3.949	4	1.041
Case 27 SOX Judgment	2	6	3.915	4	1.179
Case 28 SOX Judgment	1	4	2.475	3	0.838
Case 29 SOX Judgment	2	6	3.932	4	1.048
Case 30 SOX Judgment	1	5	2.559	2	0.815
Case 31 SOX Judgment	2	6	4.305	4	1.207
Case 32 SOX Judgment	1	6	3.254	3	1.321

Table 28. Overall SOX Case Judgments Descriptive Statistics

APPENDIX J – Auditor SOX Case Judgments (cont.)

	Min.	Max.	Mean	Median	Std. Dev.
Case 1 SOX Judgment	1	5	2.353	2.0	1.041
Case 2 SOX Judgment	1	4	1.824	2.0	0.834
Case 3 SOX Judgment	2	6	3.971	4.0	1.167
Case 4 SOX Judgment	1	6	3.176	3.0	1.218
Case 5 SOX Judgment	2	6	4.029	4.0	1.029
Case 6 SOX Judgment	1	5	2.441	2.0	0.960
Case 7 SOX Judgment	1	4	2.353	2.0	0.884
Case 8 SOX Judgment	1	7	5.000	5.5	1.595
Case 9 SOX Judgment	1	6	2.088	1.5	1.443
Case 10 SOX Judgment	1	6	1.971	2.0	1.193
Case 11 SOX Judgment	1	3	1.088	1.0	0.379
Case 12 SOX Judgment	1	7	5.441	6.0	1.481
Case 13 SOX Judgment	1	7	3.176	3.0	1.566
Case 14 SOX Judgment	1	6	3.588	3.0	1.480
Case 15 SOX Judgment	1	5	2.529	2.0	0.861
Case 16 SOX Judgment	1	6	3.235	3.0	1.257
Case 17 SOX Judgment	1	5	2.353	2.0	0.917
Case 18 SOX Judgment	2	6	3.794	4.0	1.388
Case 19 SOX Judgment	1	5	2.471	2.0	0.929
Case 20 SOX Judgment	1	7	5.206	6.0	1.473
Case 21 SOX Judgment	1	6	3.294	3.0	1.360
Case 22 SOX Judgment	4	7	6.647	7.0	0.646
Case 23 SOX Judgment	2	6	4.000	4.0	1.231
Case 24 SOX Judgment	2	6	4.118	4.0	1.200
Case 25 SOX Judgment	1	4	2.471	2.5	0.896
Case 26 SOX Judgment	2	6	3.912	4.0	1.083
Case 27 SOX Judgment	2	6	4.059	4.0	1.099
Case 28 SOX Judgment	1	4	2.618	3.0	0.853
Case 29 SOX Judgment	2	6	3.971	4.0	1.141
Case 30 SOX Judgment	2	5	2.706	3.0	0.836
Case 31 SOX Judgment	3	6	4.500	4.0	1.135
Case 32 SOX Judgment	1	6	3.559	3.5	1.307

Table 29. Auditor SOX Case Judgments Descriptive Statistics

APPENDIX J – Manager SOX Case Judgments (cont.)

	Min.	Max.	Mean	Median	Std. Dev.
Case 1 SOX Judgment	1	3	2.000	2	0.645
Case 2 SOX Judgment	1	3	1.880	2	0.781
Case 3 SOX Judgment	1	6	3.720	4	1.400
Case 4 SOX Judgment	1	6	3.360	3	1.319
Case 5 SOX Judgment	1	7	3.560	3	1.387
Case 6 SOX Judgment	1	6	2.520	2	1.122
Case 7 SOX Judgment	1	3	2.120	2	0.781
Case 8 SOX Judgment	1	7	5.440	6	1.261
Case 9 SOX Judgment	1	3	2.000	2	0.866
Case 10 SOX Judgment	1	4	2.120	2	1.054
Case 11 SOX Judgment	1	2	1.120	1	0.332
Case 12 SOX Judgment	3	7	5.720	6	0.936
Case 13 SOX Judgment	1	4	2.920	3	0.997
Case 14 SOX Judgment	1	6	2.440	2	1.356
Case 15 SOX Judgment	1	5	2.480	2	1.085
Case 16 SOX Judgment	1	6	2.800	2	1.500
Case 17 SOX Judgment	1	5	2.040	2	1.060
Case 18 SOX Judgment	2	6	3.320	3	1.069
Case 19 SOX Judgment	1	4	1.960	2	0.978
Case 20 SOX Judgment	1	7	5.520	6	1.327
Case 21 SOX Judgment	1	6	3.280	3	1.514
Case 22 SOX Judgment	6	7	6.400	6	0.500
Case 23 SOX Judgment	1	7	4.200	4	1.354
Case 24 SOX Judgment	2	6	3.680	3	0.988
Case 25 SOX Judgment	1	6	2.360	2	1.075
Case 26 SOX Judgment	2	6	4.000	4	1.000
Case 27 SOX Judgment	2	6	3.720	4	1.275
Case 28 SOX Judgment	1	4	2.280	2	0.792
Case 29 SOX Judgment	3	6	3.880	4	0.927
Case 30 SOX Judgment	1	4	2.360	2	0.757
Case 31 SOX Judgment	2	6	4.040	4	1.274
Case 32 SOX Judgment	1	5	2.840	3	1.248

Table 30. Management SOX Case Judgments Descriptive Statistics

APPENDIX K – Individual Case Correlations

	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8	Case 9	Case 10	Case 11	Case 12	Case 13	Case 14	Case 15	Case 16
Case 1	1	0.421	0.175	0.288	0.001	0.322	0.632	-0.107	0.162	0.280	0.202	0.079	0.454	0.147	0.078	0.089
Case 2	0.421	1	0.267	0.295	0.186	0.340	0.439	-0.063	0.533	0.612	0.355	-0.217	0.216	0.433	0.372	0.601
Case 3	0.175	0.267	1	0.391	0.493	0.277	0.292	0.088	0.183	0.184	0.069	0.133	0.359	0.471	0.244	0.392
Case 4	0.288	0.295	0.391	1	0.314	0.119	0.574	0.489	0.059	0.091	0.172	0.351	0.519	0.004	0.251	0.324
Case 5	0.001	0.186	0.493	0.314	1	0.388	0.230	0.398	0.216	0.232	0.161	0.186	0.283	0.487	0.361	0.475
Case 6	0.322	0.340	0.277	0.119	0.388	1	0.338	-0.106	0.407	0.389	0.243	0.070	0.201	0.388	0.332	0.278
Case 7	0.632	0.439	0.292	0.574	0.230	0.338	1	0.170	0.171	0.226	0.256	0.154	0.591	0.247	0.244	0.272
Case 8	-0.107	-0.063	0.088	0.489	0.398	-0.106	0.170	1	-0.313	-0.233	0.128	0.486	0.307	-0.155	-0.032	-0.005
Case 9	0.162	0.533	0.183	0.059	0.216	0.407	0.171	-0.313	1	0.810	0.383	-0.151	0.081	0.532	0.480	0.574
Case 10	0.280	0.612	0.184	0.091	0.232	0.389	0.226	-0.233	0.810	1	0.291	-0.145	0.044	0.548	0.480	0.567
Case 11	0.202	0.355	0.069	0.172	0.161	0.243	0.256	0.128	0.383	0.291	1	0.024	0.236	0.265	0.200	0.166
Case 12	0.079	-0.217	0.133	0.351	0.186	0.070	0.154	0.486	-0.151	-0.145	0.024	1	0.358	-0.242	-0.195	-0.204
Case 13	0.454	0.216	0.359	0.519	0.283	0.201	0.591	0.307	0.081	0.044	0.236	0.358	1	0.105	0.200	0.110
Case 14	0.147	0.433	0.471	0.004	0.487	0.388	0.247	-0.155	0.532	0.548	0.265	-0.242	0.105	1	0.378	0.632
Case 15	0.078	0.372	0.244	0.251	0.361	0.332	0.244	-0.032	0.480	0.480	0.200	-0.195	0.200	0.378	1	0.600
Case 16	0.089	0.601	0.392	0.324	0.475	0.278	0.272	-0.005	0.574	0.567	0.166	-0.204	0.110	0.632	0.600	1
Case 17	0.433	0.457	0.357	0.331	0.439	0.545	0.555	-0.113	0.549	0.614	0.131	-0.045	0.430	0.547	0.485	0.465
Case 18	0.237	0.392	0.617	0.238	0.493	0.309	0.323	-0.014	0.201	0.285	0.055	0.047	0.277	0.455	0.230	0.535
Case 19	0.214	0.270	0.308	0.299	0.345	0.464	0.214	-0.094	0.379	0.368	0.073	-0.019	0.327	0.353	0.507	0.351
Case 20	0.094	-0.014	0.297	0.536	0.349	-0.042	0.449	0.761	-0.300	-0.202	0.136	0.535	0.404	-0.080	-0.066	-0.018
Case 21	0.142	0.024	0.128	0.376	0.444	0.237	0.357	0.439	0.081	0.145	0.282	0.281	0.414	0.106	0.350	0.179
Case 22	0.111	-0.076	0.213	0.204	0.154	0.023	0.098	0.138	0.056	-0.105	-0.102	0.364	0.168	0.128	0.022	0.134
Case 23	0.030	0.432	0.594	0.406	0.469	0.140	0.300	0.323	0.196	0.333	0.132	0.055	0.237	0.420	0.375	0.648
Case 24	0.284	0.387	0.585	0.195	0.270	0.282	0.436	-0.180	0.415	0.368	0.103	-0.057	0.354	0.615	0.369	0.538
Case 25	-0.080	0.261	0.371	0.208	0.373	0.229	0.183	-0.057	0.360	0.318	0.123	0.014	0.281	0.367	0.416	0.360
Case 26	0.103	0.381	0.453	0.472	0.268	0.072	0.251	0.356	0.192	0.251	0.200	0.281	0.223	0.263	0.200	0.522
Case 27	0.162	0.422	0.374	0.271	0.596	0.420	0.335	0.139	0.469	0.469	0.267	0.055	0.285	0.560	0.515	0.665
Case 28	0.393	0.441	0.306	0.261	0.303	0.336	0.412	0.053	0.346	0.420	0.066	0.086	0.276	0.245	0.254	0.504
Case 29	0.124	0.355	0.487	0.381	0.291	0.079	0.274	0.165	0.285	0.308	0.203	0.145	0.247	0.306	0.449	0.567
Case 30	0.124	0.342	0.309	0.230	0.414	0.338	0.266	0.127	0.386	0.410	-0.021	-0.024	0.325	0.383	0.515	0.545
Case 31	0.242	0.386	0.310	0.187	0.593	0.425	0.295	0.074	0.468	0.460	0.127	0.078	0.262	0.432	0.477	0.522
Case 32	0.215	0.572	0.413	0.169	0.320	0.292	0.313	-0.078	0.525	0.538	0.127	-0.055	0.203	0.662	0.498	0.774

Table 31. Individual Case Judgment Correlations

	Case 17	Case 18	Case 19	Case 20	Case 21	Case 22	Case 23	Case 24	Case 25	Case 26	Case 27	Case 28	Case 29	Case 30	Case 31	Case 32
Case 1	0.433	0.237	0.214	0.094	0.142	0.111	0.030	0.284	-0.080	0.103	0.162	0.393	0.124	0.124	0.242	0.215
Case 2	0.457	0.392	0.270	-0.014	0.024	-0.076	0.432	0.387	0.261	0.381	0.422	0.441	0.355	0.342	0.386	0.572
Case 3	0.357	0.617	0.308	0.297	0.128	0.213	0.594	0.585	0.371	0.453	0.374	0.306	0.487	0.309	0.310	0.413
Case 4	0.331	0.238	0.299	0.536	0.376	0.204	0.406	0.195	0.208	0.472	0.271	0.261	0.381	0.230	0.187	0.169
Case 5	0.439	0.493	0.345	0.349	0.444	0.154	0.469	0.270	0.373	0.268	0.596	0.303	0.291	0.414	0.593	0.320
Case 6	0.545	0.309	0.464	-0.042	0.237	0.023	0.140	0.282	0.229	0.072	0.420	0.336	0.079	0.338	0.425	0.292
Case 7	0.555	0.323	0.214	0.449	0.357	0.098	0.300	0.436	0.183	0.251	0.335	0.412	0.274	0.266	0.295	0.313
Case 8	-0.113	-0.014	-0.094	0.761	0.439	0.138	0.323	-0.180	-0.057	0.356	0.139	0.053	0.165	0.127	0.074	-0.078
Case 9	0.549	0.201	0.379	-0.300	0.081	0.056	0.196	0.415	0.360	0.192	0.469	0.346	0.285	0.386	0.468	0.525
Case 10	0.614	0.285	0.368	-0.202	0.145	-0.105	0.333	0.368	0.318	0.251	0.469	0.420	0.308	0.410	0.460	0.538
Case 11	0.131	0.055	0.073	0.136	0.282	-0.102	0.132	0.103	0.123	0.200	0.267	0.066	0.203	-0.021	0.127	0.127
Case 12	-0.045	0.047	-0.019	0.535	0.281	0.364	0.055	-0.057	0.014	0.281	0.055	0.086	0.145	-0.024	0.078	-0.055
Case 13	0.430	0.277	0.327	0.404	0.414	0.168	0.237	0.354	0.281	0.223	0.285	0.276	0.247	0.325	0.262	0.203
Case 14	0.547	0.455	0.353	-0.080	0.106	0.128	0.420	0.615	0.367	0.263	0.560	0.245	0.306	0.383	0.432	0.662
Case 15	0.485	0.230	0.507	-0.066	0.350	0.022	0.375	0.369	0.416	0.200	0.515	0.254	0.449	0.515	0.477	0.498
Case 16	0.465	0.535	0.351	-0.018	0.179	0.134	0.648	0.538	0.360	0.522	0.665	0.504	0.567	0.545	0.522	0.774
Case 17	1	0.444	0.534	0.032	0.276	0.087	0.287	0.496	0.425	0.095	0.537	0.373	0.199	0.489	0.552	0.394
Case 18	0.444	1	0.265	0.174	0.114	0.318	0.604	0.688	0.212	0.478	0.585	0.410	0.508	0.339	0.463	0.513
Case 19	0.534	0.265	1	-0.164	0.308	0.144	0.010	0.424	0.286	-0.004	0.499	0.251	0.085	0.469	0.489	0.297
Case 20	0.032	0.174	-0.164	1	0.382	0.208	0.434	0.004	-0.019	0.423	0.184	0.197	0.319	0.072	0.009	-0.029
Case 21	0.276	0.114	0.308	0.382	1	0.098	0.253	0.099	0.362	0.162	0.346	0.130	0.141	0.321	0.372	0.163
Case 22	0.087	0.318	0.144	0.208	0.098	1	0.255	0.338	0.073	0.267	0.189	0.166	0.363	0.110	0.293	0.216
Case 23	0.287	0.604	0.010	0.434	0.253	0.255	1	0.483	0.361	0.756	0.452	0.445	0.777	0.434	0.341	0.590
Case 24	0.496	0.688	0.424	0.004	0.099	0.338	0.483	1	0.311	0.438	0.566	0.308	0.536	0.361	0.446	0.637
Case 25	0.425	0.212	0.286	-0.019	0.362	0.073	0.361	0.311	1	0.193	0.259	0.173	0.368	0.503	0.271	0.346
Case 26	0.095	0.478	-0.004	0.423	0.162	0.267	0.756	0.438	0.193	1	0.460	0.443	0.787	0.359	0.301	0.574
Case 27	0.537	0.585	0.499	0.184	0.346	0.189	0.452	0.566	0.259	0.460	1	0.513	0.428	0.409	0.721	0.590
Case 28	0.373	0.410	0.251	0.197	0.130	0.166	0.445	0.308	0.173	0.443	0.513	1	0.489	0.488	0.536	0.528
Case 29	0.199	0.508	0.085	0.319	0.141	0.363	0.777	0.536	0.368	0.787	0.428	0.489	1	0.408	0.344	0.623
Case 30	0.489	0.339	0.469	0.072	0.321	0.110	0.434	0.361	0.503	0.359	0.409	0.488	0.408	1	0.472	0.538
Case 31	0.552	0.463	0.489	0.009	0.372	0.293	0.341	0.446	0.271	0.301	0.721	0.536	0.344	0.472	1	0.556
Case 32	0.394	0.513	0.297	-0.029	0.163	0.216	0.590	0.637	0.346	0.574	0.590	0.528	0.623	0.538	0.556	1

Table 31. Individual Case Judgment Correlations (cont.)

APPENDIX L – Total Variance Explained by Components

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Comp.	Total	% of Variance	Accum. %	Total	% of Variance	Accum. %	Total	% of Variance	Accum. %
1	10.900	34.063	34.063	10.900	34.063	34.063	4.965	15.516	15.516
2	4.060	12.687	46.750	4.060	12.687	46.750	4.519	14.122	29.639
3	2.510	7.845	54.595	2.510	7.845	54.595	3.622	11.319	40.958
4	1.904	5.951	60.546	1.904	5.951	60.546	2.976	9.300	50.258
5	1.676	5.238	65.784	1.676	5.238	65.784	2.830	8.844	59.102
6	1.239	3.872	69.656	1.239	3.872	69.656	2.477	7.740	66.843
7	1.196	3.737	73.393	1.196	3.737	73.393	1.591	4.973	71.816
8	1.061	3.317	76.710	1.061	3.317	76.710	1.566	4.894	76.710
9	0.861	2.692	79.402						
10	0.732	2.286	81.688						
11	0.647	2.021	83.709						
12	0.564	1.764	85.472						
13	0.526	1.644	87.116						
14	0.499	1.559	88.675						
15	0.450	1.405	90.080						
16	0.420	1.312	91.392						
17	0.402	1.258	92.650						
18	0.370	1.157	93.807						
19	0.294	0.920	94.727						
20	0.267	0.833	95.560						
21	0.264	0.823	96.384						
22	0.236	0.738	97.122						
23	0.178	0.555	97.677						
24	0.164	0.513	98.190						
25	0.118	0.369	98.559						
26	0.102	0.320	98.879						
27	0.096	0.300	99.179						
28	0.075	0.234	99.413						
29	0.061	0.190	99.603						
30	0.055	0.172	99.775						
31	0.042	0.131	99.905						
32	0.030	0.095	100.000						

Table 32. Total Variance Explained by Components, Initial and Rotated

APPENDIX M – MANOVA Adjustments

		Weak			Strong			Overall		
		Mgmt.	**Audit**	**Total**	**Mgmt.**	**Audit**	**Total**	**Mgmt.**	**Audit**	**Total**
Comp. 1	Mean	3.143	3.395	3.281	3.104	3.210	3.168	3.126	3.303	3.228
	Std. Dev.	(0.764)	(0.868)	(0.819)	(0.967)	(0.985)	(0.961)	(0.840)	(0.919)	(0.883)
Comp. 2	Mean	2.589	3.096	2.867	2.943	2.882	2.906	2.745	2.989	2.886
	Std. Dev.	(0.854)	(0.801)	(0.851)	(0.917)	(0.755)	(0.806)	(0.882)	(0.774)	(0.823)
Comp. 3	Mean	4.518	3.985	4.226	4.250	4.353	4.313	4.400	4.169	4.267
	Std. Dev.	(0.907)	(1.200)	(1.094)	(1.260)	(1.053)	(1.117)	(1.061)	(1.128)	(1.096)
Comp. 4	Mean	2.381	2.314	2.344	2.303	2.941	2.690	2.347	2.627	2.508
	Std. Dev.	(0.678)	(0.712)	(0.686)	(0.605)	(1.156)	(1.014)	(0.635)	(0.998)	(0.867)
Comp. 5	Mean	3.286	4.103	3.734	3.295	3.632	3.500	3.290	3.868	3.623
	Std. Dev.	(0.831)	(0.923)	(0.962)	(1.166)	(1.199)	(1.177)	(0.970)	(1.081)	(1.066)
Comp. 6	Mean	2.429	2.725	2.591	2.364	2.412	2.393	2.400	2.569	2.497
	Std. Dev.	(0.973)	(0.700)	(0.833)	(0.640)	(0.607)	(0.609)	(0.828)	(0.664)	(0.736)
Comp. 7	Mean	6.071	6.029	6.048	6.045	6.059	6.054	6.060	6.044	6.051
	Std. Dev.	(0.646)	(1.125)	(0.925)	(0.472)	(0.748)	(0.643)	(0.565)	(0.940)	(0.797)
Comp. 8	Mean	1.000	1.059	1.032	1.273	1.118	1.179	1.120	1.088	1.102
	Std. Dev.	(0.000)	(0.243)	(0.180)	(0.467)	(0.485)	(0.476)	(0.332)	(0.379)	(0.357)

Table 33. Cell Means (Standard Deviations) for Initial MANOVA (Table 13)[28]

[28] This table represents the cell means and standard deviations for the MANOVA found in Table 13 and the MANCOVAs found in Table 34, Table 35, Table 38, and Table 43.

APPENDIX M – MANOVA Adjustments (cont.)

Effect	Test	Value	F	Df		Sig.
				Hypothesis	Error	
Intercept	Pillai's Trace	0.958	133.289	8	47	0.000
	Wilks' Lambda	0.042	133.289	8	47	0.000
	Hotelling's Trace	22.688	133.289	8	47	0.000
	Roy's Largest Root	22.688	133.289	8	47	0.000
Organization Size	Pillai's Trace	0.137	0.934	8	47	0.498
	Wilks' Lambda	0.863	0.934	8	47	0.498
	Hotelling's Trace	0.159	0.934	8	47	0.498
	Roy's Largest Root	0.159	0.934	8	47	0.498
Order	Pillai's Trace	0.138	0.937	8	47	0.495
	Wilks' Lambda	0.862	0.937	8	47	0.495
	Hotelling's Trace	0.160	0.937	8	47	0.495
	Roy's Largest Root	0.160	0.937	8	47	0.495
Role	Pillai's Trace	0.114	0.759	8	47	0.640
	Wilks' Lambda	0.886	0.759	8	47	0.640
	Hotelling's Trace	0.129	0.759	8	47	0.640
	Roy's Largest Root	0.129	0.759	8	47	0.640
Order * Role	Pillai's Trace	0.161	1.124	8	47	0.365
	Wilks' Lambda	0.839	1.124	8	47	0.365
	Hotelling's Trace	0.191	1.124	8	47	0.365
	Roy's Largest Root	0.191	1.124	8	47	0.365

Table 34. MANCOVA for SOX Judgments, Controlling for Organization Size

APPENDIX M – MANOVA Adjustments (cont.)

Effect	Test	Value	F	Df		Sig.
				Hypothesis	Error	
Intercept	Pillai's Trace	0.952	115.736	8	47	0.000
	Wilks' Lambda	0.048	115.736	8	47	0.000
	Hotelling's Trace	19.700	115.736	8	47	0.000
	Roy's Largest Root	19.700	115.736	8	47	0.000
Organization Size	Pillai's Trace	0.129	0.871	8	47	0.548
	Wilks' Lambda	0.871	0.871	8	47	0.548
	Hotelling's Trace	0.148	0.871	8	47	0.548
	Roy's Largest Root	0.148	0.871	8	47	0.548
Order	Pillai's Trace	0.154	1.069	8	47	0.401
	Wilks' Lambda	0.846	1.069	8	47	0.401
	Hotelling's Trace	0.182	1.069	8	47	0.401
	Roy's Largest Root	0.182	1.069	8	47	0.401
Role	Pillai's Trace	0.121	0.812	8	47	0.596
	Wilks' Lambda	0.879	0.812	8	47	0.596
	Hotelling's Trace	0.138	0.812	8	47	0.596
	Roy's Largest Root	0.138	0.812	8	47	0.596
Order * Role	Pillai's Trace	0.171	1.214	8	47	0.312
	Wilks' Lambda	0.829	1.214	8	47	0.312
	Hotelling's Trace	0.207	1.214	8	47	0.312
	Roy's Largest Root	0.207	1.214	8	47	0.312

Table 35. MANCOVA of SOX Judgments, Controlling for Organization Size (Categorical)

APPENDIX M – MANOVA Adjustments (cont.)

Effect	Test	Value	F	df		Sig.
				Hypothesis	Error	
Intercept	Pillai's Trace	0.991	516.333	8	38	0.000
	Wilks' Lambda	0.009	516.333	8	38	0.000
	Hotelling's Trace	108.702	516.333	8	38	0.000
	Roy's Largest Root	108.702	516.333	8	38	0.000
Order	Pillai's Trace	0.121	0.656	8	38	0.726
	Wilks' Lambda	0.879	0.656	8	38	0.726
	Hotelling's Trace	0.138	0.656	8	38	0.726
	Roy's Largest Root	0.138	0.656	8	38	0.726
Role	Pillai's Trace	0.106	0.561	8	38	0.803
	Wilks' Lambda	0.894	0.561	8	38	0.803
	Hotelling's Trace	0.118	0.561	8	38	0.803
	Roy's Largest Root	0.118	0.561	8	38	0.803
Order * Role	Pillai's Trace	0.323	2.266	8	38	0.043
	Wilks' Lambda	0.677	2.266	8	38	0.043
	Hotelling's Trace	0.477	2.266	8	38	0.043
	Roy's Largest Root	0.477	2.266	8	38	0.043

Table 36. MANOVA for SOX Judgments, Excluding Subjects from Local Organizations

APPENDIX M – MANOVA Adjustments (cont.)

		Weak			Strong			Overall		
		Mgmt.	**Audit**	**Total**	**Mgmt.**	**Audit**	**Total**	**Mgmt.**	**Audit**	**Total**
Comp. 1	Mean	3.088	3.429	3.265	3.125	3.173	3.156	3.102	3.301	3.216
	Std. Dev.	(0.766)	(0.814)	(0.795)	(0.915)	(0.859)	(0.858)	(0.803)	(0.831)	(0.817)
Comp. 2	Mean	2.644	3.152	2.907	2.984	2.759	2.841	2.774	2.955	2.878
	Std. Dev.	(0.863)	(0.782)	(0.846)	(0.969)	(0.644)	(0.763)	(0.897)	(0.731)	(0.802)
Comp. 3	Mean	4.462	4.143	4.296	4.094	4.339	4.250	4.321	4.241	4.276
	Std. Dev.	(0.918)	(1.228)	(1.081)	(1.445)	(1.036)	(1.173)	(1.127)	(1.119)	(1.111)
Comp. 4	Mean	2.359	2.381	2.370	2.250	2.952	2.697	2.317	2.667	2.517
	Std. Dev.	(0.700)	(0.726)	(0.700)	(0.611)	(1.124)	(1.013)	(0.654)	(0.973)	(0.861)
Comp. 5	Mean	3.327	4.214	3.787	3.563	3.446	3.489	3.417	3.830	3.653
	Std. Dev.	(0.850)	(0.784)	(0.919)	(1.193)	(1.070)	(1.090)	(0.973)	(1.000)	(1.000)
Comp. 6	Mean	2.462	2.714	2.593	2.375	2.381	2.379	2.429	2.548	2.497
	Std. Dev.	(1.005)	(0.652)	(0.834)	(0.603)	(0.611)	(0.594)	(0.857)	(0.643)	(0.736)
Comp. 7	Mean	6.000	6.036	6.019	6.125	6.036	6.068	6.048	6.036	6.041
	Std. Dev.	(0.612)	(1.200)	(0.945)	(0.354)	(0.820)	(0.678)	(0.522)	(1.009)	(0.828)
Comp. 8	Mean	1.000	1.071	1.037	1.250	1.000	1.091	1.095	1.036	1.061
	Std. Dev.	(0.000)	(0.267)	(0.192)	(0.463)	(0.000)	(0.294)	(0.301)	(0.189)	(0.242)

Table 37. Cell Means (Standard Deviations), Excluding Subjects from Local Organizations (Table 36)

APPENDIX M – MANOVA Adjustments (cont.)

Effect	Test	Value	F	Df		Sig.
				Hypothesis	Error	
Intercept	Pillai's Trace	0.874	40.783	8	47	0.000
	Wilks' Lambda	0.126	40.783	8	47	0.000
	Hotelling's Trace	6.942	40.783	8	47	0.000
	Roy's Largest Root	6.942	40.783	8	47	0.000
Sox	Pillai's Trace	0.203	1.497	8	47	0.184
Confidence	Wilks' Lambda	0.797	1.497	8	47	0.184
	Hotelling's Trace	0.255	1.497	8	47	0.184
	Roy's Largest Root	0.255	1.497	8	47	0.184
Order	Pillai's Trace	0.155	1.078	8	47	0.395
	Wilks' Lambda	0.845	1.078	8	47	0.395
	Hotelling's Trace	0.183	1.078	8	47	0.395
	Roy's Largest Root	0.183	1.078	8	47	0.395
Role	Pillai's Trace	0.123	0.820	8	47	0.589
	Wilks' Lambda	0.877	0.820	8	47	0.589
	Hotelling's Trace	0.140	0.820	8	47	0.589
	Roy's Largest Root	0.140	0.820	8	47	0.589
Order *	Pillai's Trace	0.169	1.192	8	47	0.324
Role	Wilks' Lambda	0.831	1.192	8	47	0.324
	Hotelling's Trace	0.203	1.192	8	47	0.324
	Roy's Largest Root	0.203	1.192	8	47	0.324

Table 38. MANCOVA of SOX Judgments, Controlling for SOX Confidence

APPENDIX M – MANOVA Adjustments (cont.)

Effect	Test	Value	F	df		Sig.
				Hypothesis	Error	
Intercept	Pillai's Trace	0.988	454.810	8	44	0.000
	Wilks' Lambda	0.012	454.810	8	44	0.000
	Hotelling's Trace	82.693	454.810	8	44	0.000
	Roy's Largest Root	82.693	454.810	8	44	0.000
Order	Pillai's Trace	0.173	1.154	8	44	0.348
	Wilks' Lambda	0.827	1.154	8	44	0.348
	Hotelling's Trace	0.210	1.154	8	44	0.348
	Roy's Largest Root	0.210	1.154	8	44	0.348
Role	Pillai's Trace	0.136	0.865	8	44	0.552
	Wilks' Lambda	0.864	0.865	8	44	0.552
	Hotelling's Trace	0.157	0.865	8	44	0.552
	Roy's Largest Root	0.157	0.865	8	44	0.552
Order * Role	Pillai's Trace	0.203	1.405	8	44	0.221
	Wilks' Lambda	0.797	1.405	8	44	0.221
	Hotelling's Trace	0.255	1.405	8	44	0.221
	Roy's Largest Root	0.255	1.405	8	44	0.221

Table 39. MANOVA for SOX Judgments, Excluding Subjects with no SOX Training or Non-Response

APPENDIX M – MANOVA Adjustments (cont.)

		Weak			Strong			Overall		
		Mgmt.	**Audit**	**Total**	**Mgmt.**	**Audit**	**Total**	**Mgmt.**	**Audit**	**Total**
Comp. 1	Mean	3.143	3.429	3.291	3.129	3.232	3.192	3.137	3.327	3.244
	Std. Dev.	(0.764)	(0.864)	(0.816)	(1.016)	(1.013)	(0.995)	(0.857)	(0.933)	(0.897)
Comp. 2	Mean	2.589	3.192	2.901	2.975	2.891	2.923	2.750	3.036	2.911
	Std. Dev.	(0.854)	(0.800)	(0.868)	(0.961)	(0.778)	(0.835)	(0.901)	(0.791)	(0.845)
Comp. 3	Mean	4.518	4.033	4.267	4.225	4.406	4.337	4.396	4.226	4.300
	Std. Dev.	(0.907)	(1.232)	(1.096)	(1.325)	(1.064)	(1.149)	(1.083)	(1.144)	(1.111)
Comp. 4	Mean	2.381	2.311	2.345	2.267	2.979	2.705	2.333	2.656	2.515
	Std. Dev.	(0.678)	(0.750)	(0.704)	(0.625)	(1.183)	(1.051)	(0.645)	(1.038)	(0.895)
Comp. 5	Mean	3.286	4.250	3.784	3.275	3.563	3.452	3.281	3.895	3.627
	Std. Dev.	(0.831)	(0.835)	(0.954)	(1.227)	(1.202)	(1.196)	(0.990)	(1.082)	(1.078)
Comp. 6	Mean	2.429	2.778	2.609	2.367	2.417	2.397	2.403	2.591	2.509
	Std. Dev.	(0.973)	(0.731)	(0.859)	(0.675)	(0.627)	(0.633)	(0.845)	(0.692)	(0.761)
Comp. 7	Mean	6.071	6.067	6.069	6.050	6.063	6.058	6.063	6.065	6.064
	Std. Dev.	(0.646)	(1.163)	(0.933)	(0.497)	(0.772)	(0.668)	(0.577)	(0.964)	(0.811)
Comp. 8	Mean	1.000	1.067	1.034	1.200	1.125	1.154	1.083	1.097	1.091
	Std. Dev.	(0.000)	(0.258)	(0.186)	(0.422)	(0.500)	(0.464)	(0.282)	(0.396)	(0.348)

Table 40. Cell Means (Standard Deviation), Excluding Subjects with no SOX Training or Non-Response (Table 39)

APPENDIX M – MANOVA Adjustments (cont.)

Effect	Test	Value	F	df Hypothesis	df Error	Sig.
Intercept	Pillai's Trace	0.974	156.346	8	34	0.000
	Wilks' Lambda	0.026	156.346	8	34	0.000
	Hotelling's Trace	36.787	156.346	8	34	0.000
	Roy's Largest Root	36.787	156.346	8	34	0.000
Order	Pillai's Trace	0.207	1.107	8	34	0.383
	Wilks' Lambda	0.793	1.107	8	34	0.383
	Hotelling's Trace	0.260	1.107	8	34	0.383
	Roy's Largest Root	0.260	1.107	8	34	0.383
Role	Pillai's Trace	0.267	1.549	8	34	0.177
	Wilks' Lambda	0.733	1.549	8	34	0.177
	Hotelling's Trace	0.364	1.549	8	34	0.177
	Roy's Largest Root	0.364	1.549	8	34	0.177
Order * Role	Pillai's Trace	0.199	1.053	8	34	0.418
	Wilks' Lambda	0.801	1.053	8	34	0.418
	Hotelling's Trace	0.248	1.053	8	34	0.418
	Roy's Largest Root	0.248	1.053	8	34	0.418

Table 41. MANOVA for SOX Judgments, Excluding Management Subjects with External Audit Experience

APPENDIX M – MANOVA Adjustments (cont.)

		Weak			Strong			Overall		
		Mgmt.	**Audit**	**Total**	**Mgmt.**	**Audit**	**Total**	**Mgmt.**	**Audit**	**Total**
Comp. 1	Mean	3.270	3.395	3.352	3.571	3.210	3.248	3.325	3.303	3.308
	Std. Dev.	(0.744)	(0.868)	(0.814)	(1.414)	(0.985)	(0.993)	(0.811)	(0.919)	(0.885)
Comp. 2	Mean	2.639	3.096	2.938	2.500	2.882	2.842	2.614	2.989	2.897
	Std. Dev.	(0.772)	(0.801)	(0.806)	(1.414)	(0.755)	(0.795)	(0.824)	(0.774)	(0.794)
Comp. 3	Mean	4.556	3.985	4.183	5.000	4.353	4.421	4.636	4.169	4.283
	Std. Dev.	(0.958)	(1.200)	(1.137)	(0.354)	(1.053)	(1.017)	(0.883)	(1.128)	(1.083)
Comp. 4	Mean	2.444	2.314	2.359	2.000	2.941	2.842	2.364	2.627	2.563
	Std. Dev.	(0.645)	(0.712)	(0.679)	(1.414)	(1.156)	(1.178)	(0.752)	(0.998)	(0.942)
Comp. 5	Mean	3.278	4.103	3.817	3.125	3.632	3.579	3.250	3.868	3.717
	Std. Dev.	0.643	0.923	0.915	0.530	1.199	1.149	0.602	1.081	1.015
Comp. 6	Mean	2.481	2.725	2.641	2.500	2.412	2.421	2.485	2.569	2.548
	Std. Dev.	(0.747)	(0.700)	(0.711)	(1.179)	(0.607)	(0.637)	(0.765)	(0.664)	(0.682)
Comp. 7	Mean	6.222	6.029	6.096	5.250	6.059	5.974	6.045	6.044	6.044
	Std. Dev.	(0.507)	(1.125)	(0.949)	(0.354)	(0.748)	(0.754)	(0.611)	(0.940)	(0.865)
Comp. 8	Mean	1.000	1.059	1.038	1.500	1.118	1.158	1.091	1.088	1.089
	Std. Dev.	(0.000)	(0.243)	(0.196)	(0.707)	(0.485)	(0.501)	(0.302)	(0.379)	(0.358)

Table 42. Cell Means (Standard Deviation), Excluding Managment Subjects with External Audit Experience (Table 41)

APPENDIX M – MANOVA Adjustments (cont.)

Effect	Test	Value	F	Df		Sig.
				Hypothesis	Error	
Intercept	Pillai's Trace	0.910	59.313	8	47	0.000
	Wilks' Lambda	0.090	59.313	8	47	0.000
	Hotelling's Trace	10.096	59.313	8	47	0.000
	Roy's Largest Root	10.096	59.313	8	47	0.000
External Audit Experience, Dichotomous	Pillai's Trace	0.070	0.440	8	47	0.891
	Wilks' Lambda	0.930	0.440	8	47	0.891
	Hotelling's Trace	0.075	0.440	8	47	0.891
	Roy's Largest Root	0.075	0.440	8	47	0.891
Order	Pillai's Trace	0.136	0.921	8	47	0.508
	Wilks' Lambda	0.864	0.921	8	47	0.508
	Hotelling's Trace	0.157	0.921	8	47	0.508
	Roy's Largest Root	0.157	0.921	8	47	0.508
Role	Pillai's Trace	0.071	0.449	8	47	0.885
	Wilks' Lambda	0.929	0.449	8	47	0.885
	Hotelling's Trace	0.076	0.449	8	47	0.885
	Roy's Largest Root	0.076	0.449	8	47	0.885
Order * Role	Pillai's Trace	0.144	0.989	8	47	0.457
	Wilks' Lambda	0.856	0.989	8	47	0.457
	Hotelling's Trace	0.168	0.989	8	47	0.457
	Roy's Largest Root	0.168	0.989	8	47	0.457

Table 43. MANCOVA of SOX Judgments, Controlling for External Audit Experience (Dichotomous)

APPENDIX N – Equation 1 and 2 Regression Coefficients and ANOVAs

Panel A. Equation 1

Variable	Predicted Sign	Unstandardized Coefficient	Beta	t	p-value	
Constant		0.649		5.084	0.000	*
Cue 1		1.331	0.406	14.133	0.000	*
Cue 2		0.294	0.090	3.123	0.002	*
Cue 3		0.461	0.140	4.892	0.000	*
Cue 4		1.485	0.453	15.772	0.000	*
Cue 5		0.315	0.096	3.349	0.001	*
Cue 6		1.161	0.354	12.333	0.000	*
Role		0.089	0.027	0.592	0.554	
Order		0.231	0.070	1.495	0.135	
Role x Order		-0.115	-0.032	-1.062	0.288	
Cue 1 x Role	+	-0.154	-0.043	-1.434	0.152	
Cue 2 x Role	-	0.133	0.037	1.235	0.217	
Cue 3 x Role	-	0.219	0.060	2.032	0.042	*
Cue 4 x Role	+	-0.208	-0.057	-1.930	0.054	**
Cue 5 x Role	-	0.197	0.054	1.829	0.068	**
Cue 6 x Role	+	0.111	0.031	1.026	0.305	
Cue 1 x Order		-0.058	-0.015	-0.547	0.584	
Cue 2 x Order		-0.111	-0.029	-1.045	0.296	
Cue 3 x Order		-0.285	-0.074	-2.678	0.007	*
Cue 4 x Order		0.034	0.009	0.320	0.749	
Cue 5 x Order		0.056	0.015	0.526	0.599	
Cue 6 x Order		-0.014	-0.004	-0.131	0.896	

Table 44. Equation 1 Regression Coefficients

* Significant at the $p<0.05$ level.
** Significant at the $p<0.10$ level.

APPENDIX N (Cont.) – Equation 1 and 2 Regression Coefficients and ANOVAs

Panel B. Equation 2

Variable	Predicted Sign	Unstandardized Coefficient	Beta	t	p-value	
Constant		1.403		6.118	0.000	*
Reliability of Financial (RFR) Reporting Objective		1.580	0.319	8.313	0.000	*
Effectiveness and Efficiency (EEO) of Operations Objective		0.442	0.089	2.323	0.020	*
Role		-0.114	-0.034	-0.426	0.670	
Order		0.223	0.068	0.827	0.408	
Role x Order		-0.115	-0.032	-0.804	0.422	
RFR Obj. x Role	+	0.232	0.071	1.067	0.286	
EEO Obj. x. Role	-	0.170	0.052	0.783	0.434	
RFR Obj. x Order		-0.049	-0.015	-0.227	0.821	
EEO Obj. x. Order		-0.159	-0.048	-0.738	0.461	

Table 45. Equation 2 Regression Coefficients

* Significant at the $p<0.05$ level.

APPENDIX N (Cont.) – Equation 1 and 2 Regression Coefficients and ANOVAs

Panel A. Equation 1 ANOVA – Main Effects

Variable	Sum of Squares	DF	F	p-value	
CorrectedModel	2,587.977	21	92.461	0.000	*
Intercept	1,473.498	1	1,105.521	0.000	*
Cue1	266.235	1	199.748	0.000	*
Cue2	12.996	1	9.751	0.002	*
Cue3	31.900	1	23.934	0.000	*
Cue4	331.572	1	248.769	0.000	*
Cue5	14.949	1	11.216	0.001	*
Cue6	202.725	1	152.099	0.000	*
Role	0.467	1	0.351	0.554	
Order	2.978	1	2.235	0.135	
Role * Order	1.504	1	1.129	0.288	
Cue 1 * Role	2.739	1	2.055	0.152	
Cue 2 * Role	2.032	1	1.524	0.217	
Cue 3 * Role	5.503	1	4.129	0.042	*
Cue 4 * Role	4.965	1	3.725	0.054	**
Cue 5 * Role	4.461	1	3.347	0.068	**
Cue 6 * Role	1.403	1	1.053	0.305	
Cue 1 * Order	0.399	1	0.299	0.584	
Cue 2 * Order	1.454	1	1.091	0.296	
Cue 3 * Order	9.558	1	7.171	0.007	*
Cue 4 * Order	0.136	1	0.102	0.749	
Cue 5 * Order	0.369	1	0.277	0.599	
Cue 6 * Order	0.023	1	0.017	0.896	
Error	2,487.105	1,866			
Total	25,580.000	1,888			
Corrected Total	5,075.083	1,887			

Table 46. Equation 1 ANOVA

* Significant at the $p<0.05$ level.
** Significant at the $p<0.10$ level.

APPENDIX N (Cont.) – Equation 1 and 2 Regression Coefficients and ANOVAs

Panel A. Equation 2 ANOVA

Variable	Sum of Squares	DF	F	p-value	
Corrected Model	704.123	9	33.614	0.000	*
Intercept	3,495.563	1	1,501.882	0.000	*
Reliability of Financial Reporting (RFR) Obj.	550.001	1	236.310	0.000	*
Effectiveness and Efficiency of Operations (EEO) Obj.	39.393	1	16.925	0.000	*
Role	0.126	1	0.054	0.816	
Order	0.544	1	0.234	0.629	
Role*Order	1.504	1	0.646	0.422	
EEO Obj.*Role	1.428	1	0.614	0.434	
RFR Obj.*Role	2.649	1	1.138	0.286	
EEO Obj.*Order	1.267	1	0.545	0.461	
RFR Obj.*Order	0.119	1	0.051	0.821	
Error	4,370.960	1,878			*
Total	25,580.000	1,888			
Corrected Total	5,075.083	1,887			

Table 47. Equation 2 ANOVA

APPENDIX O – Correlation Matrices

		Alloc. Cue 1	Alloc. Cue 2	Alloc. Cue 3	Alloc. Cue 4	Alloc. Cue 5	Alloc. Cue 6	Beta Cue 1	Beta Cue 2	Beta Cue 3	Beta Cue 4	Beta Cue 5	Beta Cue 6
Alloc. Cue 1	**Correlation**	1	-0.352	-0.448	0.236	-0.550	-0.145	0.617	-0.302	-0.280	-0.025	-0.255	-0.095
	p-value		0.006	0.000	0.072	0.000	0.272	0.000	0.020	0.032	0.853	0.051	0.476
Alloc. Cue 2	**Correlation**	-0.352	1	0.318	-0.522	0.237	-0.193	-0.022	0.265	0.107	-0.120	0.166	-0.159
	p-value	0.006		0.014	0.000	0.071	0.143	0.868	0.042	0.422	0.364	0.208	0.228
Alloc. Cue 3	**Correlation**	-0.448	0.318	1	-0.478	0.210	-0.327	-0.270	0.239	0.350	-0.041	0.128	-0.193
	p-value	0.000	0.014		0.000	0.111	0.012	0.039	0.069	0.007	0.761	0.334	0.143
Alloc. Cue 4	**Correlation**	0.236	-0.522	-0.478	1	-0.455	-0.178	0.034	-0.214	-0.257	0.468	-0.348	-0.016
	p-value	0.072	0.000	0.000		0.000	0.177	0.801	0.103	0.050	0.000	0.007	0.903
Alloc. Cue 5	**Correlation**	-0.550	0.237	0.210	-0.455	1	-0.215	-0.335	0.291	0.186	-0.158	0.456	-0.250
	p-value	0.000	0.071	0.111	0.000		0.102	0.010	0.025	0.159	0.234	0.000	0.056
Alloc. Cue 6	**Correlation**	-0.145	-0.193	-0.327	-0.178	-0.215	1	-0.096	-0.112	0.013	-0.246	0.001	0.646
	p-value	0.272	0.143	0.012	0.177	0.102		0.470	0.400	0.922	0.060	0.993	0.000
Beta Cue 1	**Correlation**	0.617	-0.022	-0.270	0.034	-0.335	-0.096	1	-0.261	-0.227	0.202	-0.458	-0.003
	p-value	0.000	0.868	0.039	0.801	0.010	0.470		0.046	0.083	0.125	0.000	0.983
Beta Cue 2	**Correlation**	-0.302	0.265	0.239	-0.214	0.291	-0.112	-0.261	1	0.501	-0.045	0.385	-0.225
	p-value	0.020	0.042	0.069	0.103	0.025	0.400	0.046		0.000	0.734	0.003	0.087
Beta Cue 3	**Correlation**	-0.280	0.107	0.350	-0.257	0.186	0.013	-0.227	0.501	1	-0.202	0.337	-0.161
	p-value	0.032	0.422	0.007	0.050	0.159	0.922	0.083	0.000		0.126	0.009	0.222
Beta Cue 4	**Correlation**	-0.025	-0.120	-0.041	0.468	-0.158	-0.246	0.202	-0.045	-0.202	1	-0.471	0.057
	p-value	0.853	0.364	0.761	0.000	0.234	0.060	0.125	0.734	0.126		0.000	0.668
Beta Cue 5	**Correlation**	-0.255	0.166	0.128	-0.348	0.456	0.001	-0.458	0.385	0.337	-0.471	1	-0.368
	p-value	0.051	0.208	0.334	0.007	0.000	0.993	0.000	0.003	0.009	0.000		0.004
Beta Cue 6	**Correlation**	-0.095	-0.159	-0.193	-0.016	-0.250	0.646	-0.003	-0.225	-0.161	0.057	-0.368	1
	p-value	0.476	0.228	0.143	0.903	0.056	0.000	0.983	0.087	0.222	0.668	0.004	

Table 48. Correlation of Cue Allocations and Betas

APPENDIX O (cont.) – Correlation Matrices

		Alloc. Cue 1	Alloc. Cue 2	Alloc. Cue 3	Alloc. Cue 4	Alloc. Cue 5	Alloc. Cue 6	Beta Cue 1	Beta Cue 2	Beta Cue 3	Beta Cue 4	Beta Cue 5	Beta Cue 6
Alloc.	**Correl**	1.000	-0.338	-0.447	0.212	-0.532	-0.140	0.616	-0.299	-0.282	-0.045	-0.234	-0.063
Cue 1	**p-value**		0.010	0.000	0.110	0.000	0.295	0.000	0.023	0.032	0.739	0.077	0.637
Alloc.	**Correlation**	-0.338	1.000	0.315	-0.512	0.216	-0.200	-0.013	0.262	0.106	-0.108	0.150	-0.188
Cue 2	**p-value**	0.010		0.016	0.000	0.103	0.131	0.920	0.047	0.429	0.418	0.262	0.158
Alloc.	**Correlation**	-0.447	0.315	1.000	-0.476	0.203	-0.330	-0.267	0.237	0.350	-0.035	0.121	-0.207
Cue 3	**p-value**	0.000	0.016		0.000	0.126	0.011	0.043	0.073	0.007	0.793	0.364	0.120
Alloc.	**Correlation**	0.212	-0.512	-0.476	1.000	-0.435	-0.173	0.022	-0.210	-0.258	0.459	-0.331	0.015
Cue 4	**p-value**	0.110	0.000	0.000		0.001	0.193	0.867	0.114	0.050	0.000	0.011	0.909
Alloc.	**Correlation**	-0.532	0.216	0.203	-0.435	1.000	-0.230	-0.329	0.288	0.187	-0.139	0.439	-0.302
Cue 5	**p-value**	0.000	0.103	0.126	0.001		0.082	0.012	0.028	0.159	0.299	0.001	0.021
Alloc.	**Correlation**	-0.140	-0.200	-0.330	-0.173	-0.230	1.000	-0.093	-0.114	0.012	-0.243	-0.006	0.650
Cue 6	**p-value**	0.295	0.131	0.011	0.193	0.082		0.486	0.395	0.926	0.066	0.966	0.000
Beta	**Correlation**	0.616	-0.013	-0.267	0.022	-0.329	-0.093	1.000	-0.259	-0.227	0.196	-0.454	0.010
Cue 1	**p-value**	0.000	0.920	0.043	0.867	0.012	0.486		0.050	0.086	0.140	0.000	0.940
Beta	**Correlation**	-0.299	0.262	0.237	-0.210	0.288	-0.114	-0.259	1.000	0.501	-0.041	0.383	-0.237
Cue 2	**p-value**	0.023	0.047	0.073	0.114	0.028	0.395	0.050		0.000	0.761	0.003	0.073
Beta	**Correlation**	-0.282	0.106	0.350	-0.258	0.187	0.012	-0.227	0.501	1.000	-0.201	0.339	-0.167
Cue 3	**p-value**	0.032	0.429	0.007	0.050	0.159	0.926	0.086	0.000		0.129	0.009	0.212
Beta	**Correlation**	-0.045	-0.108	-0.035	0.459	-0.139	-0.243	0.196	-0.041	-0.201	1.000	-0.463	0.079
Cue 4	**p-value**	0.739	0.418	0.793	0.000	0.299	0.066	0.140	0.761	0.129		0.000	0.558
Beta	**Correlation**	-0.234	0.150	0.121	-0.331	0.439	-0.006	-0.454	0.383	0.339	-0.463	1.000	-0.408
Cue 5	**p-value**	0.077	0.262	0.364	0.011	0.001	0.966	0.000	0.003	0.009	0.000		0.001
Beta	**Correlation**	-0.063	-0.188	-0.207	0.015	-0.302	0.650	0.010	-0.237	-0.167	0.079	-0.408	1.000
Cue 6	**p-value**	0.637	0.158	0.120	0.909	0.021	0.000	0.940	0.073	0.212	0.558	0.001	

Table 49. Correlation of Cue Allocations and Betas, Controlling for Experience

APPENDIX O (cont.) – Correlation Matrices

		Alloc. Cue 1	Alloc. Cue 2	Alloc. Cue 3	Alloc. Cue 4	Alloc. Cue 5	Alloc. Cue 6	Beta Cue 1	Beta Cue 2	Beta Cue 3	Beta Cue 4	Beta Cue 5	Beta Cue 6
Alloc.	**Correl**	1	-0.233	-0.437	0.149	-0.499	-0.125	0.647	-0.295	-0.273	-0.101	-0.194	-0.055
Cue 1	**p-value**		0.081	0.001	0.268	0.000	0.355	0.000	0.026	0.040	0.453	0.148	0.683
Alloc.	**Correlation**	-0.233	1	0.273	-0.439	0.110	-0.235	0.031	0.216	0.084	-0.062	0.083	-0.212
Cue 2	**p-value**	0.081		0.040	0.001	0.414	0.079	0.818	0.107	0.537	0.645	0.541	0.114
Alloc.	**Correlation**	-0.437	0.273	1	-0.448	0.163	-0.336	-0.253	0.210	0.346	-0.018	0.094	-0.205
Cue 3	**p-value**	0.001	0.040		0.000	0.227	0.011	0.058	0.118	0.008	0.896	0.485	0.127
Alloc.	**Correlation**	0.149	-0.439	-0.448	1	-0.385	-0.191	-0.016	-0.149	-0.254	0.463	-0.302	-0.006
Cue 4	**p-value**	0.268	0.001	0.000		0.003	0.154	0.904	0.268	0.057	0.000	0.022	0.965
Alloc.	**Correlation**	-0.499	0.110	0.163	-0.385	1	-0.242	-0.317	0.253	0.172	-0.117	0.418	-0.290
Cue 5	**p-value**	0.000	0.414	0.227	0.003		0.070	0.016	0.057	0.201	0.387	0.001	0.028
Alloc.	**Correlation**	-0.125	-0.235	-0.336	-0.191	-0.242	1	-0.098	-0.108	0.008	-0.239	-0.009	0.641
Cue 6	**p-value**	0.355	0.079	0.011	0.154	0.070		0.466	0.423	0.955	0.074	0.945	0.000
Beta	**Correlation**	0.647	0.031	-0.253	-0.016	-0.317	-0.098	1	-0.241	-0.223	0.193	-0.449	-0.001
Cue 1	**p-value**	0.000	0.818	0.058	0.904	0.016	0.466		0.071	0.095	0.151	0.000	0.993
Beta	**Correlation**	-0.295	0.216	0.210	-0.149	0.253	-0.108	-0.241	1	0.507	-0.029	0.368	-0.229
Cue 2	**p-value**	0.026	0.107	0.118	0.268	0.057	0.423	0.071		0.000	0.830	0.005	0.086
Beta	**Correlation**	-0.273	0.084	0.346	-0.254	0.172	0.008	-0.223	0.507	1	-0.192	0.329	-0.171
Cue 3	**p-value**	0.040	0.537	0.008	0.057	0.201	0.955	0.095	0.000		0.152	0.012	0.203
Beta	**Correlation**	-0.101	-0.062	-0.018	0.463	-0.117	-0.239	0.193	-0.029	-0.192	1	-0.455	0.076
Cue 4	**p-value**	0.453	0.645	0.896	0.000	0.387	0.074	0.151	0.830	0.152		0.000	0.576
Beta	**Correlation**	-0.194	0.083	0.094	-0.302	0.418	-0.009	-0.449	0.368	0.329	-0.455	1	-0.397
Cue 5	**p-value**	0.148	0.541	0.485	0.022	0.001	0.945	0.000	0.005	0.012	0.000		0.002
Beta	**Correlation**	-0.055	-0.212	-0.205	-0.006	-0.290	0.641	-0.001	-0.229	-0.171	0.076	-0.397	1
Cue 6	**p-value**	0.683	0.114	0.127	0.965	0.028	0.000	0.993	0.086	0.203	0.576	0.002	

Table 50. Correlations of Cue Allocations and Betas, Controlling for Experience with a Categorical Variable

APPENDIX O (cont.) – Correlation Matrices

		Alloc. Cue 1	Alloc. Cue 2	Alloc. Cue 3	Alloc. Cue 4	Alloc. Cue 5	Alloc. Cue 6	Beta Cue 1	Beta Cue 2	Beta Cue 3	Beta Cue 4	Beta Cue 5	Beta Cue 6
Alloc. Cue 1	**Correl**	1	-0.357	-0.456	0.261	-0.569	-0.144	0.626	-0.301	-0.295	-0.015	-0.259	-0.097
	p-value		0.006	0.000	0.048	0.000	0.282	0.000	0.022	0.025	0.914	0.050	0.471
Alloc. Cue 2	**Correlation**	-0.357	1	0.315	-0.527	0.231	-0.191	-0.038	0.267	0.099	-0.112	0.164	-0.161
	p-value	0.006		0.016	0.000	0.081	0.150	0.776	0.043	0.461	0.401	0.219	0.227
Alloc. Cue 3	**Correlation**	-0.456	0.315	1	-0.472	0.198	-0.325	-0.307	0.242	0.341	-0.024	0.124	-0.197
	p-value	0.000	0.016		0.000	0.137	0.013	0.019	0.067	0.009	0.856	0.355	0.139
Alloc. Cue 4	**Correlation**	0.261	-0.527	-0.472	1	-0.430	-0.196	0.114	-0.229	-0.222	0.442	-0.347	-0.008
	p-value	0.048	0.000	0.000		0.001	0.141	0.395	0.084	0.095	0.001	0.008	0.950
Alloc. Cue 5	**Correlation**	-0.569	0.231	0.198	-0.430	1	-0.212	-0.402	0.300	0.160	-0.130	0.454	-0.259
	p-value	0.000	0.081	0.137	0.001		0.111	0.002	0.022	0.229	0.330	0.000	0.049
Alloc. Cue 6	**Correlation**	-0.144	-0.191	-0.325	-0.196	-0.212	1	-0.089	-0.113	0.020	-0.258	0.003	0.648
	p-value	0.282	0.150	0.013	0.141	0.111		0.508	0.400	0.881	0.050	0.981	0.000
Beta Cue 1	**Correlation**	0.626	-0.038	-0.307	0.114	-0.402	-0.089	1	-0.265	-0.289	0.265	-0.491	-0.011
	p-value	0.000	0.776	0.019	0.395	0.002	0.508		0.045	0.028	0.045	0.000	0.933
Beta Cue 2	**Correlation**	-0.301	0.267	0.242	-0.229	0.300	-0.113	-0.265	1	0.513	-0.050	0.387	-0.224
	p-value	0.022	0.043	0.067	0.084	0.022	0.400	0.045		0.000	0.707	0.003	0.091
Beta Cue 3	**Correlation**	-0.295	0.099	0.341	-0.222	0.160	0.020	-0.289	0.513	1	-0.176	0.333	-0.169
	p-value	0.025	0.461	0.009	0.095	0.229	0.881	0.028	0.000		0.187	0.011	0.204
Beta Cue 4	**Correlation**	-0.015	-0.112	-0.024	0.442	-0.130	-0.258	0.265	-0.050	-0.176	1	-0.470	0.064
	p-value	0.914	0.401	0.856	0.001	0.330	0.050	0.045	0.707	0.187		0.000	0.636
Beta Cue 5	**Correlation**	-0.259	0.164	0.124	-0.347	0.454	0.003	-0.491	0.387	0.333	-0.470	1	-0.370
	p-value	0.050	0.219	0.355	0.008	0.000	0.981	0.000	0.003	0.011	0.000		0.004
Beta Cue 6	**Correlation**	-0.097	-0.161	-0.197	-0.008	-0.259	0.648	-0.011	-0.224	-0.169	0.064	-0.370	1
	p-value	0.471	0.227	0.139	0.950	0.049	0.000	0.933	0.091	0.204	0.636	0.004	

APPENDIX P – Regression Equation for Main Effects and Interaction Effects of Internal Control Cues for all Subjects

Variable	Unstandardized Coefficient	Beta	T	p-value	
Constant	1.102		7.444	0.000	
Cue1	0.702	0.214	3.653	0.000	*
Cue2	0.450	0.137	3.375	0.001	*
Cue3	0.296	0.090	1.833	0.067	**
Cue4	0.957	0.292	4.976	0.000	*
Cue5	0.550	0.168	2.669	0.008	*
Cue 1 * Cue 3	0.324	0.086	1.321	0.187	
Cue 1 * Cue 4	0.494	0.130	1.723	0.085	
Cue 1 * Cue 5	-0.150	-0.040	-0.768	0.442	
Cue 1 * Cue 6	0.441	0.116	1.489	0.137	
Cue 2 * Cue 5	-0.068	-0.018	-0.229	0.819	
Cue 2 * Cue 6	-0.121	-0.032	-0.492	0.623	
Cue 3 * Cue 4	0.206	0.054	0.837	0.402	
Cue 3 * Cue 5	0.104	0.027	0.423	0.672	
Cue 4 * Cue 5	-0.133	-0.035	-0.682	0.495	
Cue 4 * Cue 6	0.407	0.107	1.374	0.169	
Cue 5 * Cue 6	0.823	0.251	5.104	0.000	*
Cue 1 * Cue 2 * Cue 3	0.233	0.047	1.084	0.279	
Cue 1 * Cue 2 * Cue 4	0.021	0.004	0.119	0.905	
Cue 1 * Cue 2 * Cue 5	-0.017	-0.003	-0.054	0.957	
Cue 1 * Cue 2 * Cue 6	-0.242	-0.049	-1.123	0.261	
Cue 1 * Cue 3 * Cue 4	-0.517	-0.104	-1.747	0.081	
Cue 1 * Cue 3 * Cue 6	-0.258	-0.052	-0.781	0.435	
Cue 1 * Cue 4 * Cue 6	0.369	0.074	0.751	0.453	
Cue 2 * Cue 3 * Cue 4	-0.182	-0.037	-0.847	0.397	
Cue 2 * Cue 3 * Cue 5	-0.271	-0.055	-0.687	0.492	
Cue 2 * Cue 3 * Cue 6	0.114	0.023	0.532	0.595	
Cue 2 * Cue 4 * Cue 5	0.042	0.009	0.136	0.892	
Cue 2 * Cue 4 * Cue 6	-0.216	-0.044	-1.005	0.315	
Cue 2 * Cue 5 * Cue 6	0.123	0.025	0.498	0.618	
Cue 3 * Cue 4 * Cue 6	-0.004	-0.001	-0.013	0.990	
Cue 1 * Cue 2 * Cue 3 * Cue 4 * Cue 5 * Cue 6	0.966	0.103	1.851	0.064	

Table 51. Regression Equation for Main Effects and Interaction Effects of Internal Control Cues for all Subjects

* Significant at the $p<0.05$ level.
** Significant at the $p<0.10$ level.

APPENDIX P – Regression Equation for Main Effects and Interaction Effects of Internal Control Cues for all Subjects (cont.)

Variable	Unstandardized Coefficient	Beta	T	p-value	
Constant	1.088		5.495	0.000	*
Cue 1	0.893	0.273	3.473	0.001	*
Cue 2	0.371	0.114	2.080	0.038	*
Cue 3	0.364	0.111	1.687	0.092	**
Cue 4	1.070	0.327	4.159	0.000	*
Cue 5	0.452	0.138	1.641	0.101	
Cue 1 * Cue 3	0.125	0.033	0.381	0.704	
Cue 1 * Cue 4	0.125	0.033	0.326	0.745	
Cue 1 * Cue 5	-0.081	-0.021	-0.309	0.758	
Cue 1 * Cue 6	0.294	0.078	0.743	0.458	
Cue 2 * Cue 5	0.059	0.016	0.149	0.882	
Cue 2 * Cue 6	0.110	0.029	0.336	0.737	
Cue 3 * Cue 4	0.184	0.049	0.560	0.576	
Cue 3 * Cue 5	0.184	0.049	0.560	0.576	
Cue 4 * Cue 5	0.007	0.002	0.028	0.978	
Cue 4 * Cue 6	0.235	0.062	0.594	0.553	
Cue 5 * Cue 6	0.901	0.276	4.174	0.000	*
Cue 1 * Cue 2 * Cue 3	0.289	0.059	1.005	0.315	
Cue 1 * Cue 2 * Cue 4	0.113	0.023	0.474	0.636	
Cue 1 * Cue 2 * Cue 5	-0.005	-0.001	-0.012	0.991	
Cue 1 * Cue 2 * Cue 6	-0.446	-0.090	-1.550	0.121	
Cue 1 * Cue 3 * Cue 4	-0.441	-0.089	-1.114	0.266	
Cue 1 * Cue 3 * Cue 6	-0.103	-0.021	-0.232	0.816	
Cue 1 * Cue 4 * Cue 6	0.456	0.092	0.694	0.488	
Cue 2 * Cue 3 * Cue 4	-0.181	-0.037	-0.630	0.529	
Cue 2 * Cue 3 * Cue 5	-0.181	-0.037	-0.343	0.731	
Cue 2 * Cue 3 * Cue 6	0.083	0.017	0.290	0.772	
Cue 2 * Cue 4 * Cue 5	-0.181	-0.037	-0.434	0.664	
Cue 2 * Cue 4 * Cue 6	-0.211	-0.043	-0.733	0.464	
Cue 2 * Cue 5 * Cue 6	0.157	0.032	0.475	0.635	
Cue 3 * Cue 4 * Cue 6	0.015	0.003	0.033	0.974	
Cue 1 * Cue 2 * Cue 3 * Cue 4 * Cue 5 * Cue 6	0.902	0.096	1.291	0.197	

Table 52. Regression Equation for Main Effects and Interactions for Internal Control Cues of Auditor Subjects

* Significant at the $p<0.05$ level.
** Significant at the $p<0.10$ level.

APPENDIX P – Regression Equation for Main Effects and Interaction Effects of Internal Control Cues for all Subjects (cont.)

Variable	Unstandardized Coefficient	Beta	T	p-value	
Constant	1.120		5.100	0.000	*
Cue 1	0.442	0.135	1.551	0.121	
Cue 2	0.558	0.170	2.817	0.005	*
Cue 3	0.203	0.062	0.846	0.398	
Cue 4	0.802	0.245	2.813	0.005	*
Cue 5	0.683	0.208	2.233	0.026	*
Cue 1 * Cue 3	0.595	0.157	1.634	0.103	
Cue 1 * Cue 4	0.995	0.263	2.340	0.020	*
Cue 1 * Cue 5	-0.245	-0.065	-0.843	0.399	
Cue 1 * Cue 6	0.640	0.169	1.457	0.145	
Cue 2 * Cue 5	-0.240	-0.063	-0.546	0.585	
Cue 2 * Cue 6	-0.435	-0.115	-1.195	0.233	
Cue 3 * Cue 4	0.235	0.062	0.645	0.519	
Cue 3 * Cue 5	-0.005	-0.001	-0.014	0.989	
Cue 4 * Cue 5	-0.325	-0.086	-1.119	0.264	
Cue 4 * Cue 6	0.640	0.169	1.457	0.145	
Cue 5 * Cue 6	0.717	0.219	2.998	0.003	*
Cue 1 * Cue 2 * Cue 3	0.157	0.032	0.491	0.624	
Cue 1 * Cue 2 * Cue 4	-0.103	-0.021	-0.392	0.696	
Cue 1 * Cue 2 * Cue 5	-0.033	-0.007	-0.072	0.943	
Cue 1 * Cue 2 * Cue 6	0.037	0.007	0.115	0.909	
Cue 1 * Cue 3 * Cue 4	-0.620	-0.125	-1.412	0.158	
Cue 1 * Cue 3 * Cue 6	-0.470	-0.095	-0.957	0.339	
Cue 1 * Cue 4 * Cue 6	0.250	0.050	0.343	0.731	
Cue 2 * Cue 3 * Cue 4	-0.183	-0.037	-0.575	0.566	
Cue 2 * Cue 3 * Cue 5	-0.393	-0.079	-0.672	0.502	
Cue 2 * Cue 3 * Cue 6	0.157	0.032	0.491	0.624	
Cue 2 * Cue 4 * Cue 5	0.347	0.070	0.749	0.454	
Cue 2 * Cue 4 * Cue 6	-0.223	-0.045	-0.700	0.484	
Cue 2 * Cue 5 * Cue 6	0.077	0.015	0.209	0.834	
Cue 3 * Cue 4 * Cue 6	-0.030	-0.006	-0.061	0.951	
Cue 1 * Cue 2 * Cue 3 * Cue 4 * Cue 5 * Cue 6	1.053	0.112	1.360	0.174	

Table 53. Regression Equation for Main Effects and Interactions for Internal Control Cues of Management Subjects

* Significant at the $p<0.05$ level.
** Significant at the $p<0.10$ level.