External Auditors’ Reliance on the Internal Audit Function: The Role of Second-Order Belief Attribution

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Abstract

The purpose of the current study is to examine the degree of reliance external auditors are willing to place on the work of the internal audit function (IAF) when the IAF’s objectivity might be compromised. Experienced external auditors (N = 142) participated in a 2 (reporting relationship: audit committee of the board of directors [ACBOD] or chief finance officer [CFO]) by 2 (IAF involvement in the area being audited: low or high) between-participant experiment. The findings indicated that when the IAF reported to the ACBOD, external auditor reliance was lower when the IAF’s involvement was higher; however, when the IAF reported to the CFO, the opposite results obtained. The unusual pattern in the CFO condition can be explained via second-order belief attribution theory; that is, the external auditors believed that the CFO must have allowed the IAF’s involvement to be low (high) because the CFO had relatively low (high) confidence in the IAF’s competence in the area being audited. The results suggest that the external auditor participants appear to have impounded, at least partially, their second-order-derived beliefs into their own cognitive schema and acted accordingly, as perceptions of decreased objectivity associated with high involvement and the reporting structure were more than offset by high competency beliefs when the IAF reported to the CFO. The study findings hold implications for both theory and practice in the area of external auditor reliance on the work of others.

Key words: internal audit function, external auditor reliance, SAS 65, second-order belief attribution
I. INTRODUCTION

The objective of this study is to investigate the extent to which external auditors will rely on the work of the internal audit function (IAF) when there are indications that the objectivity of the IAF might be compromised. Auditing Standard 5 (AS No. 5) (PCAOB 2007) indicates that AU section 322 (AU 322), entitled *The Auditor's Consideration of the Internal Audit Function in an Audit of Financial Statements* (AICPA 1991), “…applies in an integrated audit of the financial statements and internal control over financial reporting” (¶ 16). Both AS No. 5 and AU 322 suggest that external auditors should determine the extent to which they will rely on the work of others (e.g., internal auditors) based on the external auditors’ assessment of the others’ objectivity and competence. AU 322 also includes a number of factors that external auditors should consider when assessing the objectivity of internal auditors. Among the factors most relevant to the current study are the reporting relationship of the IAF and the extent of prior IAF non-audit involvement in the area being audited by the external auditors.

Prior research examining the relationship between the IAF and the external auditor has focused on how external auditor reliance is affected when the IAF reports to upper management versus the audit committee of the board of directors (ACBOD), with mixed results (Gramling et al. 2004). For instance, Abdel-khalik et al. (1983), Schneider (1985), Maletta (1993) and Maletta and Kida (1993) reported that reliance increased when the IAF reported to the ACBOD as compared to upper management; however, Margheim (1986) and Margheim and Label (1990) found no such effect. Analysis of these studies suggests that the salience of a potential objectivity compromise related to reporting structure is more pronounced when the reporting relationship of the IAF is coupled with other potential objectivity or competency issues.
In the current study, the external auditor is tasked with evaluating the design and testing the effectiveness of internal controls related to recently implemented financial accounting modules incorporated into an existing enterprise resource planning (ERP) system. While conducting an integrated audit, the external auditor is asked to decide whether and to what extent to rely on the internal control evaluation and test work the IAF has performed in this area. One potential conflict of interest in the current study is the IAF’s level of involvement in designing internal controls during the implementation process, which is either relatively high or low. The other potential objectivity compromise is the IAF reporting structure, where the IAF reports either to the ACBOD or the CFO.

Based on the results of prior literature and theory, we initially predicted that there would be a decrease in reliance in the CFO condition as compared to the ACBOD condition, and that this decrease would be greater when the internal auditor's level of involvement is high, relative to low, primarily because the dual objectivity concerns of high involvement and reporting to the CFO were expected to yield a sizable decrease in external auditor reliance on the IAF. However, because prior research findings in this area have been mixed and are somewhat dated, we conducted a focus group comprised of external audit managers and partners before administering our study to provide a degree of external validity to the predictions.

Unexpectedly, the focus group described a different thought process when making the reliance decision under these circumstances and proposed opposite outcomes. Specifically, the focus group predicted the decrease in reliance from the ACBOD and CFO conditions would be smaller when the internal auditor's level of involvement is high, relative to low, mainly because the external auditors would believe that the IAF's competence in the area being audited is related to its level of involvement. Interestingly, the external auditors’ belief in this regard is expected to
be inferentially derived from the CFO’s presumed belief in the IAF’s competence. Qualitative analysis of the focus group’s discussion led to an insightful theory that appears to underlie the external auditors’ cognitive reasoning process. The theory, second-order belief attribution (Yuill 1984), describes how an observer (external auditor) infers beliefs about an actor’s (ACBOD or CFO) intention from the actor’s action (level of involvement allowed); after which the observer impounds, at least partially, the second-order-derived beliefs into his/her own belief system and acts in accordance with those beliefs.

A total of 142 experienced external auditors participated in a two (reporting relationship: ACBOD or CFO) by two (level of involvement in designing internal controls during the implementation process: low or high) between-participant experiment. The findings indicate an interaction pattern that is consistent with the focus group’s expectations. Analysis of post-experiment debriefing items supports the expectations of second-order belief attribution theory. Finally, supplemental analyses suggest that the external auditor ranks the importance of IAF competence higher than IAF objectivity when making the reliance decision.

The current study extends prior research in the area of external auditor reliance on the work of internal auditors by examining this issue in a post Sarbanes-Oxley (SOX; U.S. House of Representatives 2002) environment with an emphasis on internal controls over accounting information systems during an integrated audit. From a theoretical perspective, to our knowledge, this is the first study to apply the concept of second-order belief attribution in auditing. Also, this is the first study of which we are aware to examine the effect of prior IAF involvement in designing internal controls related to accounting information systems on the external auditor’s reliance decision. From a practical perspective, external auditors should be
trained to understand the concept of second-order belief attribution, and realize how misattributions can unknowingly bias auditor beliefs, judgments, and decisions.

The remainder of this paper is organized as follows. The next section summarizes prior research, and offers our competing hypotheses. The following two sections present the research method and analyze the experimental data. Finally, the paper concludes with a discussion of the study’s findings.

II. BACKGROUND AND HYPOTHESES

The Public Company Accounting Oversight Board (PCAOB), the American Institute of Certified Public Accountants (AICPA), and the International Auditing and Assurance Standards Board (IAASB) provide guidance to external auditors in assessing the objectivity of the IAF. Auditing Standard 5 (AS NO. 5) (PCAOB 2007) allows auditors to determine the extent of use of others’ work based on the auditors’ assessment of the “…competence and objectivity of persons whose work the auditor plans to use…” (¶ 18). AS NO. 5 also references AU322, which includes a number of factors to use in assessing the objectivity of the internal auditor. Among the factors most relevant to this study are the reporting relationship of the IAF and the IAF’s prior involvement in the area being audited (AICPA 1991). The IIASB issued International Standard on Auditing (ISA) 610 (redrafted) entitled Using the Work of Internal Auditors (ISA 2008), which also requires external auditors to evaluate the objectivity of the internal auditors with respect to the level to which the IAF reports and consider any potential conflicts of interest the internal auditors might have in the area being audited.

Some prior literature exists regarding factors used by external auditors to assess the quality of the IAF and form the reliance decision. The factors commonly studied are those emphasized in professional standards: objectivity, competence, and work performance (Bonner
In the current study, we examine two types of potential objectivity impairment: the reporting relationship of the IAF and the extent to which the IAF has prior involvement in the area being audited. In addition, while not manipulated in our experiment, the external auditors’ belief in the IAF’s competence in the audit area will factor into the reliance decision, as discussed later.

**Objectivity & Reporting Relationship of the Internal Auditor**

One means of assessing IAF objectivity is for the external auditor to review the reporting relationship of the IAF. While an IAF is required for all companies listed on the New York Stock Exchange, there are few restrictions on the reporting relationship of the IAF within the organization. In addition, professional standards allow considerable leeway in reporting relationships, as long as the chief audit executive (CAE) reports to a level that allows the IAF to fulfill its responsibilities (IIA 2008).

The 2006 Common Body of Knowledge (Burnaby et al., 2006) issued by The Institute of Internal Auditors Research Foundation reports that in publicly traded companies, 55% of CAE’s report to the audit committee/board of directors, 42% report to executive level management within the company, and the remaining 3% percent report to others. Thus, the reporting relationship of the IAF primarily varies between the ACBOD and upper management.

Some prior research examining the impact of reporting relationship on assessments of IAF objectivity has suggested that reporting relationship is an important factor in auditors’ reliance decisions. For instance, Abdel-khalik et al. (1983) found a significantly higher level of external auditor reliance on the IAF when the IAF reported to the board of directors versus management. Schneider (1985), Maletta (1993) and Maletta and Kida (1993) also reported that reliance increased when the IAF reported to the ACBOD, as compared to management; further, the latter two studies indicated that objectivity interacted with competence in the reliance
decision. All of the above studies employed within-participant experimental designs involving multiple factors.

Other studies have found no relationship between the reliance decision and reporting relationship. For example, Margheim (1986) used a between-participant experimental design and found that objectivity, as operationalized through reporting relationship of either the audit committee or the controller, was not a significant factor in external auditors’ reliance decisions. In a follow up study using another between-participant design, Margheim and Label (1990) found similar non-significant results. Margheim (1986) and Margheim and Label (1990) suggested that their non-significant findings, relative to significant findings in other research (Abdel-khalik et al. 1983; Schneider 1985; Maletta 1993; Maletta and Kida 1993), could be attributed to the difference in experimental designs; that is, the within-participant designs used in other research revealed different levels of objectivity to participants (e.g., each participant was exposed to both the ACBOD and the controller reporting relationships), relative to the between-participant designs in which participants were exposed to a single reporting structure (either the ACBOD or the controller). As Margheim (1986, 203) stated, perhaps “…external auditors will not react to internal auditor objectivity unless they explicitly consider other potential objectivity levels.” This observation suggests that external auditors might be more likely to react to multiple sources of potential objectivity impairment, the combination of which might make the objectivity issue more salient.

In the current study, in conjunction with manipulating the IAF reporting relationship, we introduce another factor that might also impair objectivity and lessen the external auditor’s extent of reliance on the IAF. Specifically, we examine the extent to which the IAF was involved
in designing internal controls related to newly implemented financial accounting modules
contained within an enterprise resource planning (ERP) system.

Objectivity & Internal Auditor Involvement in Information Systems Implementations

The importance of information systems as part of the overall internal control environment
continues to grow as organizations become increasingly dependent on such systems for
accounting information. System implementation and upgrades often involve complex, integrated
ERP systems that require significant financial and personnel resources for effective
implementation and internal control (Brazel and Agoglia 2007). Well-publicized issues at early
adopters such as Hershey Foods and Whirlpool (Boudette 1999) resulted in increased awareness
of the risks associated with poorly executed implementations. In addition, section 404 of the
Sarbanes-Oxley Act (U.S. House of Representatives 2002) has increased executive awareness of
the importance of information systems in financial statement accuracy. Therefore, is seems
reasonable that the ACBOD and executive management might include the IAF on
implementation teams, at least in an advisory role, to maximize the opportunities for a
controllable and auditable implementation.

One of the potential threats to IAF objectivity occurs when the IAF audits areas in which
its internal auditors have previously been involved in designing controls or developing operating
procedures, thereby creating potential conflicts of interest (Messier and Schneider 1988).
Professional codes of the Institute of Internal Auditors, General Accounting Office and the
Chartered Institute of Public Finance and Accountancy standards all explicitly warn of these
potential conflicts. To our knowledge, no prior study has examined the 'designing system
controls' conflict as it relates to the external auditor reliance decision. In closely related studies,
though, Plumlee (1985) and Church and Schneider (1992) investigated how internal auditors’ prior involvement in designing control systems affected their objectivity.

Plumlee (1985) investigated how internal auditors’ prior involvement in the design of a control system affected their subsequent control evaluation judgments. Using a two-stage experiment with practicing internal auditors, the results suggested that internal auditors who reviewed a control system they designed, relative to a control system that other internal auditors designed, perceived the controls to be stronger; additionally, internal auditors who were involved with designing the control system identified more strengths of the system, and those who were not involved with designing the control system identified more weaknesses. The findings suggest impaired objectivity when internal auditors are involved with evaluating the same control system they helped to design.

The experimental design employed by Church and Schneider (1992) involved three groups: the participants, who were role playing as internal auditors, either (1) were involved in designing internal controls for an accounts receivable (AR) system, (2) were involved in designing internal controls for an accounts payable (AP) system, or (3) were not involved in designing internal controls for either system. Subsequent to their involvement or non-involvement, the participants were asked to allocate 15 audit hours to investigate an unusually high current ratio, which could have arisen from misstatements from the AR system, AP system, or both. The authors hypothesized that internal auditors who had prior involvement in either the AR or AP system would allocate fewer hours to that system, as they would be less motivated to search for problems where prior involvement existed. However, they found that prior involvement did not affect the allocation of audit hours, relative to allocation of hours to other areas in which the auditors had no previous system design experience. The authors suggested
that the internal auditors who were previously involved were able to maintain their objectivity. It could be, though, that they were unable to recognize their own conflict of interest and objectivity compromise in the same way as would an independent party, such as external auditors.

Despite the potential benefits of including the IAF in system implementations, there are concerns about this course of action because of the possible impairment to objectivity. However, several researchers question whether this concern is worthwhile, given that excluding the IAF from system implementation participation might prevent the company from reaping the rewards of including experienced professionals with internal control expertise. In calls for future research in the area of information systems implementations, Boritz (2002) and Hermanson et al. (2000) ask researchers to investigate why the IAF performs so little work in this area given that internal controls surrounding such systems represent critical risk areas to the company. The Institute of Internal Auditors indicates that there are no standards expressly prohibiting this type of IAF involvement (IIARF 2009); yet, AU 322 (AICPA 1991) cautions external auditors to consider potential objectivity impairment in areas where the IAF was recently assigned. Thus, there is a tradeoff of potentially improved internal controls over information systems as a result of IAF involvement in implementation processes, with potentially decreased IAF objectivity regarding those systems and related internal controls. We suggest that the external auditor will evaluate that tradeoff differently, depending on to whom the IAF reports within the organization.

**Interaction between Reporting Relationship and Implementation Involvement**

Prior research suggests that the external auditor reliance decision is complex and does not necessarily rely on a single factor. Such research has taken into account interactions among internal audit related factors such as objectivity, work performance, and competence; as well as environmental factors such as risk and management integrity (Krishnamoorthy 2001, 2002; Maletta and Kida 1993; Margheim and Label 1990). Some studies have indicated that the most
important factor in the reliance decision is the quality of work performed, followed by competency, with objectivity trailing in last place (e.g. Schneider 1984, 1985); while Messier and Schneider (1988) found competency to be the most important factor, followed by objectivity and then by work performed.

Extending this research, Desai et al. (2006) propose an IAF assessment model built on three IAF factors from prior research (objectivity, work performance, and competence). They suggest that modeling the “and” relationship among these factors is an essential step in assessing the strength of the IAF and in evaluating the ability to rely on the IAF, because in reality the reliance decision is based on a combination of factors. This suggests that external auditors will seek additional evidence beyond the reporting relationship of the IAF before deciding the extent to rely on the internal control work of the IAF. With regard to information systems, such additional evidence would likely include the IAF’s prior involvement in designing and implementing controls, coupled with the IAF’s competence in the area being audited.

Based on prior literature (Margheim 1986; Margheim and Label 1990), we might expect no difference in the extent of reliance the external auditor will place on the work of the IAF between the two reporting relationships (ACBOD or CFO) when IAF involvement in the implementation process is low, due to relative non-salience of the objectivity compromise associated with the reporting relationship in absence of another objectivity or competency concern. However, since the issue of IAF involvement is raised to consciousness, even though the involvement level is low, such awareness might focus attention on the general issue of objectivity, and specifically, on the reporting relationship of the IAF, as suggested by Margheim (1986) and Margheim and Label (1990). The background literature leaves us with the following questions: When the involvement level is low, do we expect no reliance difference between the
ACBOD and CFO conditions or a decrease in reliance when the IAF reports to the CFO? In the final analysis, we select a moderate position and expect a relatively small decrease in reliance when the IAF reports to the CFO, compared to the ACBOD, when the involvement level is low.

On the other hand, when the IAF’s level of involvement is relatively high, the objectivity compromise related to involvement is expected to become quite salient. This objectivity compromise should trigger an associated objectivity concern about the reporting relationship. As a result, we anticipate a relatively large decrease in reliance when the IAF reports to the CFO, as compared to reporting to the ACBOD, when the involvement level is high. The interaction expectation is depicted on Figure 1 and presented below as hypothesis one (H1):

H1: The decrease in external auditors’ reliance on the audit-related work of the IAF from the ACBOD to the CFO reporting conditions will be larger when the IAF's level of involvement in the area being audited is high, relative to low.

Because prior results in this area are mixed and somewhat dated, we decided to conduct a focus group before administering the study to provide some indication of external validity regarding our predictions. Surprisingly, the focus group expected opposite findings, as next described.

Focus Group

The focus group was comprised of five audit partners and three audit managers from two of the Big 4 CPA firms. The demographics are presented in Table 1. The focus group administrator, who is a professional in conducting focus groups and is not one of the researchers, asked the focus group participants to assume that they were tasked with evaluating the design of and testing the effectiveness of internal controls related to newly implemented financial
accounting modules for an existing client during an integrated audit. They were further asked to
discuss the factors they would consider when deciding the extent to which they would rely on the
work of the IAF to assist them in performing the necessary audit steps. They were shown four
case scenarios (see Appendix A) and the dependent response items (see Appendix B). One of the
researchers was concealed behind a two-way mirror and observed the group discussion. The
focus group lasted for one hour and 45 minutes.

[Insert Table 1 about here]

The focus group administrator allowed the group to decide how to organize its
discussion. The only request of the administrator was that the group members verbalize their
reasoning processes, so that all members of the group could better understand each other.

After reading the materials, the group first discussed the relevance and importance of the
overall study. They indicated that a study of this nature is sorely needed, as they are faced with
increasing efficiency-related pressure to work with and rely on the IAF, and nearly every client
has an operational IAF; thus, anything they can learn about how to improve the quality of this
complex judgment would be very welcome to practice. They also mentioned that for nearly half
of their clients, the IAF reported to upper management, primarily the CFO, and they were
worried about the IAF’s independence and objectivity in this scenario. Finally, they discussed
the high frequency of having to decide whether and to what extent to use the IAF in the area
being audited by the external auditor, as the IAF typically has prior involvement at some level in
nearly all areas of internal control, especially internal control related to complex information
systems.

The group next decided to discuss the two involvement scenarios (low and high) when
the IAF reported to the ACBOD. The group members began by discussing their perceptions of
the IAF’s overall competence, and noted that the IAF appeared to be quite competent based on
the case scenario. They next discussed the IAF’s objectivity. First, they agreed that the IAF
appeared quite objective, overall, since they reported directly to the ACBOD rather than upper
management. However, they felt as though the IAF that was highly involved in the
implementation process would be less objective with respect to assisting the external auditor than
the IAF that was not highly involved in the implementation. They expressed that the external
auditor likely could properly supervise the internal control evaluation and testing tasks such that
he/she could rely on the work of the IAF to some extent, although the degree of reliance likely
would be greater in the low involvement condition than in the high involvement condition.

The group indicated that the ACBOD likely would understand the objectivity
compromise of the IAF if the internal auditors were highly involved in the implementation. The
discussion then turned to inferring possible motives of the ACBOD in allowing the objectivity
compromise. They expressed that the ACBOD likely would have been aware of and expressly
allowed the IAF to become highly involved in designing the internal controls, as both the
ACBOD and IAF would recognize the IAF’s objectivity compromise when testing and
evaluating the controls related to the financial accounting system in the future. After more
discussion, they attributed the ACBOD’s motive for allowing the high involvement/future
objectivity impairment tradeoff to the ACBOD’s belief that upper management’s ability to
otherwise ensure proper design and implementation of internal controls must be quite low.

Next, the focus group discussed the high and low involvement conditions when the IAF
reported to the CFO. The group recognized that the overall objectivity of the IAF would be lower
when the IAF reports to the CFO relative to the ACBOD. Based on the case scenario, the group
again felt as though the IAF was quite competent overall. The group next expressed that the CFO
likely would have a better understanding of the IAF’s relative competencies in different areas than the ACBOD, since face-to-face interactions between the IAF and CFO would be more intense and more frequent than interactions between the IAF and the ACBOD.

The group then discussed, in considerable detail, the possible motive of the CFO in allowing the IAF to be highly involved, or not, in the implementation process. The focus group suggested that the CFO likely would understand the future objectivity compromise created by a high level of involvement. They concluded that the CFO probably would not allow (would allow) high involvement because the CFO’s belief that the IAF’s competency in designing proper internal controls over the accounting information system must be low (high). Thus, when comparing the low and high involvement conditions, their reasoning was as follows: in the high involvement condition, the external auditor’s reliance decision would involve a tradeoff of a low objectivity concern related to reporting to the CFO, a low objectivity concern about high involvement in the implementation, and a high competency belief in the IAF in the area being audited. In the low involvement condition, there would be a tradeoff of a low objectivity concern related to reporting to the CFO, a high objectivity concern associated with low involvement, and a low competence belief in the IAF in the area being audited.

Finally, the focus group discussed whether there would be a reliance difference between the high and low involvement conditions when the IAF reported to the CFO. The group concluded that they could properly plan and conduct the audit such that the internal auditors' potential objectivity compromise due to system involvement and/or the reporting relationship could be adequately addressed. The group further indicated that it would place substantially more decision weight on competency than objectivity. As a result, based on the case materials, the group indicated that it would rely more on the testing and evaluating work of the IAF when the
internal auditors' involvement was high, relative to low, because this would signal that the CFO must hold more confidence in the IAF's ability to properly designing the internal controls related to the financial accounting modules, thus the IAF must be quite competent in this regard.

**Second-Order Belief Attribution**

Results from the focus group revealed the potentially influential role of second-order belief attribution in the external auditor’s reliance decision. The notion of second-order belief attribution involves an observer (e.g., external auditor) forming beliefs about an actor’s (e.g., the ACBOD or CFO) beliefs based on the actor’s action (e.g., allowing or not allowing the IAF to be highly involved in the implementation process); and then, at least partially, impounding the second-order-derived beliefs into the observer’s own belief system. Once the observer subsumes some or all of the second-order attributed beliefs, his/her subsequent judgments and decisions are affected. The concept of second-order belief attribution arises from child psychology (Yuill 1984). Once an observer has deduced another person’s intentional beliefs (accurately or not), the observer’s beliefs and actions are formed by what he/she believes that the other person believes (Perner and Wimmer 1985; Perner 1991).

Second-order belief attribution differs from the concept of strategic reasoning, which refers to one party’s (e.g., an auditor’s) ability to anticipate another’s (client’s) response to the auditor’s strategy (Wilks and Zimbleman 2004). Second-order belief attribution also differs from the notion of ‘stylization,’ which refers to a situation where a subordinate modifies his/her audit approach and work paper organization to influence the superior’s judgments or to conform to the superior’s preferences (Rich et al. 1997). Neither strategic reasoning nor stylization suggests that one party will impound another’s beliefs into his/her belief system, as does the notion of second-order belief attribution.
Second-Order Belief Attribution When the IAF Reports to the ACBOD

Based on results of the focus group, when the IAF reports to the ACBOD, the external auditor might form a second-order belief that the ACBOD would not have allowed the IAF to become highly involved in an information system implementation process, thereby compromising future objectivity of the IAF to evaluate the effectiveness of such internal controls, unless the ACBOD lacked confidence in upper management’s ability to otherwise ensure that relevant internal controls are properly designed. Since this second-order belief attribution does not involve the IAF’s competency, we suggest that the external auditor will focus solely on the reduced objectivity implied by the high involvement in internal controls design and will thus rely less on the work of the IAF when the involvement is high relative to low (see Figure 2).

Second-Order Belief Attribution When the IAF Reports to the CFO

The focus group highlighted a different second-order belief attribution when the IAF reports to the CFO. Specifically, the external auditor might form a belief that the CFO would not compromise the IAF’s future objectivity in evaluating the effectiveness of internal controls related to the information systems being implemented unless the CFO was highly confident in the competence of the IAF in designing such controls. Conversely, if the CFO did not allow a high level of involvement, the external auditor might take this as a signal of the CFO’s lack of confidence in the IAF’s competency in designing proper internal controls. Hence, in the high involvement condition, we suggest that the external auditor will tradeoff a relatively high level of perceived IAF competence with two sources of impaired objectivity (reporting to the CFO and high involvement); in the low involvement condition, the external auditor will tradeoff relatively
high IAF objectivity related to low involvement with a relatively low level of perceived IAF competence and an objectivity impairment related to reporting to the CFO.

**Competing Hypothesis**

Based on the focus group discussion and second-order belief attribution theory, we set forth a competing hypothesis. The interaction pattern, depicted on Figure 2, is opposite from the pattern shown for H1 primarily due to second-order-derived IAF competency beliefs in the area being audited. When developing H1, the IAF’s competence in the area being audited was assumed to be constant across conditions as we do not manipulate competence in our experiment. When developing H2, based on second-order belief attribution theory and qualitative analysis of the focus group discussion, external auditors likely will believe that the IAF’s competence in the area being audited is low (high) when involvement was low (high), thereby exerting downward (upward) pressure on the reliance decision. When these different competency beliefs are coupled with the focus group’s indication that the IAF’s competence in the area being audited is weighted substantially higher than 'reporting relationship' and 'involvement' objectivity concerns in forming the reliance judgment, the following interaction hypothesis (H2) arises:

H2: The decrease in external auditors' reliance on the audit-related work of the IAF from the ACBOD to the CFO reporting conditions will be smaller when the IAF’s level of involvement in the area being audited is high, relative to low.

[Insert Figure 2 about here]

**III. RESEARCH METHOD**

The current study involves a randomized between-participant experiment that included two independent variables: reporting structure (Chief Finance Officer or Audit Committee of the Board of Directors) and level of involvement in designing the internal controls related to newly
implemented financial accounting modules contained within an enterprise resource planning system (low or high).

Pilot Testing

Aside from the focus group discussed above, there were three separate pilot tests, each involving different audit managers and partners who did not participate in the experiment. The first two pilot tests were conducted at a Big-4 firm and the third was conducted at a regional firm. While both firms were used to recruit experimental participants, the offices at which the pilot tests took place were not involved in the experiment.

The first pilot test involved two managers and one partner. The purpose of this pilot was to refine the case scenario so that the independent variables were impactful, while not triggering hypothesis guessing. Based on this pilot test, we eliminated some irrelevant background information that might cause unnecessary confusion; in addition, such removal shortened the case. We originally had the IAF reporting to the Chief Executive Officer rather than the CFO; however, the pilot group participants thought that it would be more realistic to have the IAF report to the CFO. The second pilot test involved three managers and one senior. The purpose was to refine the dependent variable wording and scaling, which led to some refinements. The third pilot test involved two managers and two partners. The objective was to improve the wording and scaling of the debriefing items. After some discussion and refining, the pilot group participants were satisfied.¹

Administration

One of the authors was conducting internal training for one Big-4 firm and one regional firm. The topic of the two-hour training session focused on information technology business

¹ The focus group, described earlier, read the final experimental materials after incorporating the pilot groups’ recommendations.
continuity planning. At each firm, there was a training session from 10 am - 12 pm and another one from 1-3 pm, resulting in a total of four training sessions. The participants reflected external auditors across the hierarchy of position levels. At the beginning of each session, the trainer asked the participants if they would volunteer to participate in a research study that would take about 15 minutes to complete.\(^2\) All training attendees volunteered to participate.

The study began by having the participants read and sign a voluntary consent form. Afterward, they were handed two closed envelopes. The first envelope contained the case scenario and dependent variables. The four treatment conditions were randomly ordered when the first envelopes were placed into a stack. The experimenter handed out the envelopes from top to bottom of the stack. The second envelope contained the manipulation check, debriefing, and demographic items. Once all participants had both envelopes in their possession, they were instructed to open the first envelope, read the case, and answer the questions. They were asked to place all materials into and seal the first envelope before opening the second envelope.

**Independent Variables**

Participants were randomized into one of the four case scenarios shown in Appendix A. A given participant read that the IAF reported to either the audit committee of the board of directors (ACBOD) or the chief finance officer (CFO), and that the IAF’s level of involvement in the designing internal controls during the system implementation process was either low or high.

**Dependent Variables**

After reading the case scenario, participants were asked to respond to four items, which are presented in Appendix B.\(^3\) After placing the experimental materials into and sealing the first envelope, three

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\(^2\) The 15 minute time constraint was imposed by the participating CPA firms, thus the experimental material had to be concise.

\(^3\) The four dependent variable items were randomly ordered into four versions.
envelope, participants opened the second envelope and answered the manipulation check, debriefing and demographic items.

IV. RESULTS

Participants

A total of 142 auditors participated in the experiment: 82 (60%) from a Big-4 CPA firm and 60 (40%) from a regional CPA firm (see Table 2). There was a higher percent of female auditors (n = 91, 64%) than male auditors (n = 51, 36%) in the sample. The mean age was 29.71 years and the mean experience as an external auditor was 5.82 years. Only six of the auditors had previously served as internal auditors. Most of the participants were certified public accountants (85%). Finally, 24% were staff auditors, 35% were senior auditors, 39% were audit managers and 12% were audit partners. There were no significant differences (p > .10) between the two firms nor were there any significant differences (p > .10) across treatment conditions on any of the demographic factors; thus, the randomization procedure was deemed successful.

[Insert Table 2 about here]

Manipulation Checks

One manipulation check item asked participants to indicate whether the internal audit function reported to the CFO or the ACBOD. All participants correctly answered this question in accordance with their treatment condition.

A second manipulation check item asked about the level of internal audit function involvement in designing the internal controls related to the newly implemented financial reporting modules (1 = very low, 7 = very high). The means (standard deviations) for the low and high involvement conditions, respectively, were 1.12 (0.37) and 6.93 (0.26). The means are significantly different (t = -107.31, p < .01) in the anticipated direction. In addition, all
participant responses were on the anticipated side of the scale’s midpoint. Based on the manipulation check item analyses, the manipulations were deemed successful.

Based on the advice of the first pilot group mentioned earlier, we did not state firm size in the case materials because such indication might have restricted generalizability of the results to the company size indicated in the case. Not mentioning client size, however, likely introduced statistical noise into the experiment thereby biasing against rejecting the null hypotheses. In the post-experiment debriefing analysis, we asked participants about their perceptions of client size (1 = very small, 4 = medium, 7 = very large). The mean (standard deviation) was 5.18 (1.42), and the means were not significantly different across treatment conditions (F = 0.22, p = .88).

Next, we asked the participants to characterize the IAF’s overall competence, notwithstanding the IAF’s involvement in the implementation process (1 = very low, 4 = moderate, 7 = very high). The overall mean (standard deviation) was 4.65 (1.88) and there was no significant difference among treatment means (F = 0.49, p = .69).

We also asked the participants to characterize the IAF’s overall objectivity, notwithstanding the IAF’s involvement in the implementation process (1 = very low, 4 = moderate, 7 = very high). The overall mean (standard deviation) was 3.93 (2.04), but a one-way ANOVA (using the four treatments and the independent variable) indicated a difference among treatment means (F = 45.89, p < .01). Scheffe’s multiple pairwise comparison (alpha = .01) indicated the following pattern of means: CFO x low involvement (2.39) = CFO x high involvement (2.56) < ACBOD x low involvement (5.41) = ACBOD x high involvement (5.29). Thus, the participants perceived that the IAF was significantly more objective, on an overall basis, when it reported to the ACBOD, relative to the CFO.
Finally, we asked participants whether they believed that the IAF (1) decided on its own the level of involvement to take in the implementation process without seeking permission from the ACBOD (or CFO), (2) decided on its own the level of involvement to take in the implementation process, but sought permission from the ACBOD (or CFO), (3) worked with the ACBOD (or CFO) in deciding the allowed level of involvement in the implementation process, or (4) was told by the ACBOD (or CFO) the level of involvement to take in the implementation process. All participants chose the third option, suggesting that they understood that the ACBOD or CFO would take part in deciding and expressly allowing the low or high level of involvement.

**Preliminary Testing**

An inter-item reliability estimate (Cronbach’s alpha) was conducted on the four dependent variable items. The analysis revealed a relatively high estimate (alpha = .88), suggesting that the items are reflecting the same latent construct. A principle component factor analysis supported this conclusion, as only one factor with an Eigenvalue >1 emerged across the four dependent variables (Eigenvalue = 2.96, variance explained = 73.89%). Hence, the four items were averaged into a single index termed “extent of reliance”.

Using the extent of reliance index as a dependent variable, we next ran an ANCOVA model that included the two independent variables (reporting structure and involvement in designing the internal controls) and an interaction term; in addition, all of the demographic factors shown on Table 2, along with version number (there were four versions) and session number (there were four sessions), were included as potential covariates.

The ANCOVA model yielded an adjusted R² of .81. The main effects of reporting structure (F = 314.63, p < .01) and involvement in designing the internal controls (F = 4.07, p = .05) were significant, as was the interaction term (F = 216.87.14, p < .01). None of the covariates
were significant, as the lowest p-value was obtained for session number \((F = 1.77, \ p = .19)\). Thus, the covariates were not included in the upcoming analyses.

**Hypotheses Testing**

The treatment means, standard deviations and sample sizes are shown on Table 3, panel A. The main effect for reporting structure suggests a higher level of reliance when the internal audit function reports to the audit committee (mean = 5.44), relative to the CFO (mean = 2.83). The main effect for level of involvement indicates a higher level of reliance for low involvement (mean = 4.30) versus high involvement (3.99). Examination of treatment means suggests a possible interaction, as the level of reliance for the CFO is relatively low for low involvement and relatively high for high involvement, while this pattern is reversed when the IAF reports to the ACBOD.

[Insert Table 3 about here]

The results of ANOVA testing are presented on Table 3, panel B. External auditor reliance on the work of the IAF is significantly higher when the IAF reports to the audit committee, relative to the chief finance officer \((p < .01)\), and the level of reliance is greater when the IAF was less involved in designing the internal controls, although the significance level is marginal \((p = .06)\). However, the main effects cannot be interpreted in a straightforward fashion since there is a significant interaction term \((p < .01)\), as postulated by both H1 and H2. A graph of the observed treatment means is presented on Figure 3.

[Insert Figure 3 about here]

Table 3, panel C presents the results of a contrast test of difference-in-differences. H1 predicted that the decrease in reliance will be larger from the ACBOD to the CFO conditions when the level of involvement is high, relative to low; H2 expected that the decrease in reliance will be smaller from the ACBOD to the CFO conditions when the level of involvement is high,
relative to low. The difference in mean reliance between the ACBOD and CFO conditions when involvement was high (0.36) is significantly smaller than when involvement is low (4.74), thereby supporting competing hypothesis H2; hence, the results support the focus group's expectations.

**Post-Hoc Comparisons**

We ran a one-way ANOVA, with the four treatment conditions as the independent variable and the extent of reliance as the dependent variable. The model was significant (F = 183.34, p < .01). We then conducted a Scheffe's multiple pairwise test (alpha = .01) to examine which means are significantly different from each other. The results indicate that the 'CFO x High Involvement' mean (3.81) and 'ACBOD x High Involvement' mean (4.17) are not significantly different; however, all other pairwise comparisons are significant. This suggests that when the IAF reported to the ACBOD, mean reliance in the low involvement condition (6.64) was greater than the high involvement condition (4.17). This finding indicates that the single objectivity compromise of high involvement in designing the system controls was salient enough in the minds of the external auditors to dampen their reliance on the IAF's evaluation and testing of those same controls.

The post-hoc comparison also reveals that, in the CFO condition, the low involvement mean (1.90) is significantly lower than the high involvement mean (3.81). This result suggests that the external auditors' beliefs related to the IAF's competence in designing system controls (beliefs which were apparently second-order-derived from the CFO) were afforded considerable weight in the reliance decision.
Post-Experiment Debriefing Items

Table 4 presents the wording, scaling and statistical analysis of 12 post-experiment debriefing items. Items 1 and 2 ask about the participants’ perceptions of their own qualifications to evaluate the design of and test the effectiveness of internal controls related to the newly implemented financial reporting modules described in the case. For both questions, there are no significant differences across treatment conditions. The overall means between items 1 and 2 are significantly different ($t = 7.37, p < .01$), suggesting that the participants felt more qualified to evaluate the design of internal controls (mean = 4.41) than to test the internal controls (3.27).

[Insert Table 4 about here]

Items 3 and 4 ask whether the external auditors would involve information technology specialists who work for the same CPA firm to help in evaluating the design of and testing the effectiveness of internal controls. For both items, there is no significant difference across treatment conditions. However, the overall means for items 3 and 4 are significantly different ($t = 13.62, p < .01$), indicating that they would be more likely to ask the information technology specialists to assist in testing (mean = 3.11), relative to evaluating (mean = 1.44), the internal controls.

The next two items ask the participants to characterize the IAF’s objectivity with regard to helping the external auditor in evaluating the design of internal controls (item 5, mean = 4.19) and testing the effectiveness of internal controls (item 6, mean = 4.22). Both items reveal the same pattern; that is, the means for CFO are significantly lower than the means for ACBOD, and the means for high involvement are significantly lower than the means for low involvement. These two objectivity means (items 5 and 6) are not significantly different from each other ($t =
The pattern of means in the CFO condition more closely resembles the expected interaction pattern of H1 than H2.

Items 7 and 8 focus on the IAF’s competence with regard to helping the external auditor evaluate the design of internal controls (item 7, mean = 5.20) and test the effectiveness of internal controls (item 8, mean = 5.25). Both items show a similar pattern of means; specifically, perceived competence is lower in the “CFO x low involvement” condition, and the other means are higher but equivalent across the remaining three conditions. The two competence means (items 7 and 8) are not significantly different (t = 0.97, p = .33). The pattern of means in the CFO condition more closely resembles the expected interaction pattern of H2 than H1.

Item 9 asks about the IAF’s competence in designing the internal controls during implementation (item 9, mean = 5.22). The same pattern emerges for item 9 as did for items 7 and 8, which again is more consistent with H2 than H1 in the CFO condition. The pattern that is apparent in items 7, 8 and 9 is consistent with the second-order belief attribution identified by the focus group; specifically, the CFO must have allowed the IAF’s involvement to be low (high) because the CFO believed that the IAF’s competence in this area was relatively low (high).

The next item (10) involves the participant’s second-order belief attributions about the IAF’s future objectivity in assessing the effectiveness of the internal controls related to the financial accounting modules (item 10, mean = 4.62). As expected from the focus group discussion, when the ACBOD or CFO allowed the IAF to become highly involved, the future objectivity means were significantly lower, relative to when the IAF was not highly involved. Therefore, our results indicate that the external auditors believe that the ACBOD or CFO allowed this involvement despite their recognition of this objectivity compromise.
Item 11 asks the participants to render second-order belief attributions about the ACBOD’s (or CFO’s) belief in the IAF’s competence to design the internal controls during implementation (item 11, mean = 5.24). The pattern of means for item 11 mirrors items 7 through 9. This indicates that the external auditor participants apparently subsumed their second-order-derived beliefs about the IAF’s competence into their own belief systems.

The last item (12) asks about the ACBOD’s belief in upper management’s competence in ensuring that the internal controls would be properly designed (item 12, mean = 4.78). Participants in the ACBOD condition indicate that the ACBOD believes that upper management’s competence is lower in the “ACBOD x high involvement” condition (mean = 2.14) than the ACBOD x low involvement” condition (mean = 5.57). We also asked this question to participants who were randomized into the CFO condition and they indicated no difference between the low involvement (mean = 5.56) and high involvement (mean = 5.82) conditions. The second-order belief attribution indicated in item 12 supports the focus group’s assertions, and helps in understanding the pattern of means that obtained for the primary dependent variable in this study (extent of reliance).

Supplemental Analysis

We performed a supplemental analysis to better understand the relative importance of objectivity and competence in the external auditor’s reliance decision in this study. Debriefing items 5 and 6 were averaged into a composite “objectivity” index (r = .98), and debriefing items 7 and 8 were averaged into a composite “competency” index (r = .96) (see Table 5, panel A). Shown on panel B of Table 5 are the results of a regression analysis that includes the objectivity and competency indices, but not the interaction of both. As indicated, the beta coefficient for objectivity (.40) is smaller than the beta coefficient for competency (.70), which supports the
relative higher weighting given to competence as indicated by the focus group. As presented on panel C of Table 5, the interaction term is significant and the beta coefficient is larger (.62) than the objectivity index (-.10, which is non-significant) or the competency index (.43 and significant). The latter analysis highlights the interactive effect of objectivity and competence, as well as the persistent significant main effect of competence once the interaction is included in the model. Thus, the second-order belief attribution of competence from the CFO to the external auditor appears to have impacted the auditor’s reliance decision.

[Insert Table 5 about here]

V. DISCUSSION

The primary objective of this study focuses on the extent to which external auditors will rely on the work of the internal audit function (IAF) when the IAF’s objectivity might be compromised in the area of interest to the external auditor. Study findings indicate that the answer to this question depends on whether the IAF reports to the audit committee of the board of directors (ACBOD) or to the chief finance officer (CFO).

In a 2x2 between-participant randomized experiment, the IAF reports to the ACBOD or the CFO, and the IAF’s level of involvement in designing internal controls related to newly implemented financial accounting modules of an enterprise resource planning system is relatively low or high. The external auditors (participants) are tasked with evaluating and testing the internal controls related to the financial accounting modules in conjunction with an integrated audit, and asked the extent to which they would request direct assistance from and rely on the work of the IAF in this audit area.

Based on prior research in this area, we expected a relatively small decrease in reliance in the low involvement condition when the IAF reports to the CFO, as compared to the ACBOD. However, in the high involvement condition, when IAF reports to the CFO versus the ACBOD,
the decrease in reliance was predicted to be relatively large due to dual objectivity concerns of reporting relationship and high involvement.

Before administering the experiment, we conducted a focus group comprised of five external audit partners and three audit managers from two of the Big-4 CPA firms to provide some external validity to our predicted findings, as prior research findings in this area have been mixed and are somewhat dated. The focus group raised the possibility that we might obtain an opposite interaction pattern.

The focus group believed that the external auditor would attempt to second-guess and partially impound the ACBOD’s or CFO’s motive for allowing the IAF’s involvement to be high or low, as surely both the ACBOD and CFO would understand the objectivity compromise that such involvement would bring about with regard to the IAF’s future objectivity in evaluating and testing the effectiveness of the internal controls surrounding the financial accounting modules. Thus, the focus group reasoned, there must be an ulterior motive. Based on analysis of the focus group’s discussion, the focus group’s beliefs about such motives emerged, as did the theoretical notion of second-order belief attribution.

The focus group indicated that when the IAF reports to the ACBOD, the ACBOD likely will allow the IAF to become highly involved in the implementation process because the ACBOD has a low level of confidence in upper management’s ability to ensure that internal controls over the financial reporting modules will be properly designed. When the IAF reports the CFO, the CFO likely will allow a high (low) level of involvement if the CFO has a high (low) level of confidence in the IAF’s competency in designing proper controls related to the financial accounting modules. Thus, to the extent that the external auditors impound such second-order derived beliefs into their own belief systems, one would expect opposite findings as
indicated in prior research. Specifically, in the low involvement condition, there will be a relatively large decrease in reliance when the IAF reports to the CFO, relative to the ACBOD, because in the CFO condition, the external auditors will impound (at least partially) their second-order-derived belief (from the CFO's actions) that the IAF's competence in the area of designing controls related to the financial accounting modules must be quite low; in the high involvement condition, there will be a relatively small decrease in reliance when the IAF reports to the CFO, as compared to the ACBOD, because objectivity compromises associated with high involvement and reporting to the CFO will be offset by a second-order-derived belief (from the CFO's actions) of high IAF competency in the area being audited.

The observed interaction pattern was more consistent with the focus group (H2) than with prior research (H1). The study findings coupled with debriefing analyses suggest that second-order belief attribution, was operant, to some extent, in the external auditors’ reliance decision.

The results support an observation made by Margheim (1986, 203), indicating that perhaps “…external auditors will not react to internal auditor objectivity unless they explicitly consider other potential objectivity levels.” In the current study, we suggest that external auditors in the ACBOD and CFO conditions had to consider the objectivity of the IAF based on the IAF’s independence from management and the objectivity of the internal auditors based on the IAF’s prior involvement in the area being audited. Such compounding of objectivity assessments might help to explain why we found a significant main effect between the ACBOD and CFO conditions, where some prior studies have found no such effect (Margheim 1986; Margheim and Label 1990). Further, when the IAF reported to the CFO, competency of the IAF in the area being audited came into question and further complicated the reasoning process. As suggested by Schneider (1984, 1985) and Messier and Schneider (1988), competency of the IAF appears to be
more important than objectivity in the reliance decision, which was apparent in the CFO condition, indicated by the focus group and verified by our supplemental analyses.

The current study is limited in several ways. The focus group of managers and partners might not reflect the beliefs and perceptions of other external auditors in the profession; however, this concern is somewhat mitigated, as the experimental results and debriefing analyses appear to support the focus group’s chain of logic and second-order belief attribution theory. The focus group might have neglected to consider other possible explanations/motives of CFO and ACBOD behavior, which in turn would not have been considered in debriefing questions yet might also be influencing external auditors’ reliance decisions through second order belief attribution. The experimental participants might not generalize to other external auditors, as they were recruited from a training session. The case materials were quite simple, mainly due to time constraints; thus, the complexity and interaction of myriad real-world considerations might alter the effects found in this study. The case materials held audit risk at a constant (relatively low) risk level, and interactions with a different risk levels might alter the effects found in this study. Within the parameters of these limitations, the results hold theoretical and practical implications.

This study explores and begins development of new theory related to external auditor reliance on the work of the internal audit function—a topic that calls for renewed attention in the current audit environment. To our knowledge, this is the first study to examine the extent to which IAF involvement in designing internal controls for accounting information systems affects the external auditor’s reliance decision when the external auditor has been tasked with evaluating and testing such controls. Further, to our knowledge, this is the first study to incorporate the notion of second-order belief attribution into the auditor judgment and decision-making literature. Interestingly, irrespective of the accuracy of second-order belief attribution, auditors
appear to absorb, at least partially, their second-order derived beliefs into their decision schema and act accordingly. This can be problematic when the second-order attribution is incorrect, as the auditors’ reactions might be inefficient or inappropriate under the circumstances.

We suggest that future research should attempt to uncover other areas where auditors might be engaging in second-order belief attribution, knowingly or unknowingly, and find ways to debias this type of unsubstantiated second-guessing of others’ motives. Future research should also further examine the interaction of IAF involvement in system implementation with other factors, such as IAF experience and/or size. Practitioners can potentially benefit from this study, as mere awareness of this judgment bias can help auditors to understand the implications thereof and remedy any potentially detrimental judgment biases resulting therefrom.
Appendix A – Case Scenario and Independent Variable Manipulations

The experimental treatments are shown in bold below, but the words were neither bolded nor italicized in the experimental materials shown to participants. There are four different scenarios: 1) the IAF reports to the audit committee of the board of directors and the IAF was not highly involved in the implementation, 2) the IAF reports to the audit committee of the board of directors and the IAF was highly involved in the implementation, 3) the IAF reports to the chief financial officer (CFO) and the IAF was not highly involved in the implementation, 4) the IAF reports to the CFO and the IAF was highly involved in the implementation.

Assume that you are an external auditor for a publicly-held company. The company has an Internal Audit Function (IAF), staffed by appropriately educated, certified and experienced professionals. The Chief Audit Executive of the IAF reports directly to the Audit Committee of the Board of Directors (Chief Finance Officer). Last year, your CPA firm conducted the integrated financial statement audit for the client company, resulting in an unqualified opinion and no internal control deficiencies or weaknesses. During the current year, the client company implemented relevant financial accounting modules of an existing Enterprise Resource Planning (ERP) system, including the following: General Ledger, Accounts Receivable and Accounts Payable.

You have been assigned to evaluate the design and test the effectiveness of internal controls related to the new financial accounting modules as part of your firm’s integrated financial statement audit. You have determined that the extent of involvement by the IAF in designing the internal controls related to the financial accounting modules was very low (very high). You have also determined that the IAF tested the effectiveness of internal controls related to the new financial accounting modules after the new ERP system went “live” a few months ago.
### Appendix B – Dependent Variable Response Items

1. To what extent would you rely on internal control testing related to the new financial accounting modules already conducted by the Internal Audit Function (IAF) [please circle one number on the scale below]?

   | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
---|---|---|---|---|---|---|---|---|---|---|----|
I would not rely at all on the IAF testing | I would rely totally on the IAF testing |

2. I believe that the percentage of planned audit hours in my time budget allocated to testing the internal controls related to the new financial accounting modules could be reduced by approximately _____% due to my reliance on the IAF testing [please circle one number on the scale below].

   | 0% | 10% | 20% | 30% | 40% | 50% | 60% | 70% | 80% | 90% | 100% |
---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|

3. To what extent would you directly involve the IAF to assist you in evaluating the design of internal controls related to the new financial accounting modules [please circle one number on the scale below]?

   | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
---|---|---|---|---|---|---|---|---|---|---|----|
I would not directly involve the IAF at all | I would moderately involve the IAF | I would let the IAF perform all of the design evaluation |

4. To what extent would you directly involve the IAF to assist you in testing the effectiveness of internal controls related to the new financial accounting modules [please circle one number on the scale below]?

   | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
---|---|---|---|---|---|---|---|---|---|---|----|
I would not directly involve the IAF at all | I would moderately involve the IAF | I would let the IAF perform all of the internal control testing |
References


Table 1 – Focus Group Participant Demographics

<table>
<thead>
<tr>
<th></th>
<th>Big-4 Firm 1</th>
<th>Big-4 Firm 2</th>
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<tbody>
<tr>
<td>Number of Auditor Managers</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Number of Auditor Partners</td>
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<td>3</td>
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</table>

**Gender**

<table>
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<tr>
<th></th>
<th>Big-4 Firm 1</th>
<th>Big-4 Firm 2</th>
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</thead>
<tbody>
<tr>
<td>Number of Male Auditors</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Number of Female Auditors</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

**Age**

Mean (Standard Deviation) 41.38 (7.21)

**Years Experience as an External Auditor**

Mean (Standard Deviation) 18.00 (7.27)
Table 2 – Experimental Participant Demographics

<table>
<thead>
<tr>
<th>Firm</th>
<th>Number of Auditors from a Big-4 CPA Firm (percentage)</th>
<th>82</th>
<th>60%</th>
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<td></td>
<td>Number of Auditors from a Regional CPA Firm (percentage)</td>
<td>60</td>
<td>40%</td>
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<td>Total</td>
<td></td>
<td>142</td>
<td>100%</td>
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<table>
<thead>
<tr>
<th>Gender</th>
<th>Number of Male Auditors (percentage)</th>
<th>51</th>
<th>(36%)</th>
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<tr>
<td></td>
<td>Number of Female Auditors (percentage)</td>
<td>91</td>
<td>(64%)</td>
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<table>
<thead>
<tr>
<th>Age</th>
<th>Mean (Standard Deviation)</th>
<th>29.71</th>
<th>(4.41)</th>
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<table>
<thead>
<tr>
<th>Experience as an External Auditor</th>
<th>Mean (Standard Deviation)</th>
<th>5.82</th>
<th>(3.61)</th>
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<th>Previous Experience as an Internal Auditor</th>
<th>Number (percentage)</th>
<th>6</th>
<th>(0.04%)</th>
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<tr>
<td></td>
<td>Mean (Standard Deviation) Years</td>
<td>2.33</td>
<td>(1.51)</td>
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<table>
<thead>
<tr>
<th>Certified Public Accountant</th>
<th>Yes (percentage)</th>
<th>121</th>
<th>(85%)</th>
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<tr>
<td></td>
<td>No (percentage)</td>
<td>21</td>
<td>(15%)</td>
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<table>
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<tr>
<th>Position Level</th>
<th>Number of Staff Auditors (percentage)</th>
<th>34</th>
<th>(24%)</th>
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<tr>
<td></td>
<td>Number of Senior Auditors (percentage)</td>
<td>35</td>
<td>(25%)</td>
</tr>
<tr>
<td></td>
<td>Number of Manager Auditors (percentage)</td>
<td>56</td>
<td>(39%)</td>
</tr>
<tr>
<td></td>
<td>Number of Partner Auditors (percentage)</td>
<td>17</td>
<td>(12%)</td>
</tr>
</tbody>
</table>

*a None of the demographic variables are significantly different between the Big-4 and Regional firms: gender ($X^2 = .30, p = .58$), age ($t = .01, p = .99$), years experience as an external auditor ($t = .035, p = .71$), number of participants who have experience as an internal auditor ($X^2 = .20, p = .65$), years experience as an internal auditor ($t = .33, p = .74$), certified public accountant ($X^2 = .01, p = .95$), position level ($X^2 = 3.66, p = .30$). Additionally, there were four randomized versions of the experimental materials, the distribution of which was not significantly different between the Big-4 and Regional firms ($X^2 = 1.06, p = .79$).
Table 3 – External Auditors’ Reliance on the Internal Audit Function

**Panel A: Mean (standard deviation) \{sample size\} across treatment conditions**

<table>
<thead>
<tr>
<th>IAF Level of Involvement in Designing the Internal Controls</th>
<th>Internal Audit Function (IAF) Reporting Structure</th>
<th>Main Effect: Level of Involvement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Chief Finance Officer</td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>1.90 (0.60) {36}</td>
<td>4.30 (2.51) {73}</td>
</tr>
<tr>
<td>High</td>
<td>3.81 (0.98) {34}</td>
<td>3.99 (0.95) {69}</td>
</tr>
<tr>
<td><strong>Main Effect:</strong> IAF Reporting Structure</td>
<td>2.83 (1.25) {70}</td>
<td><strong>IAF Reporting Structure</strong></td>
</tr>
<tr>
<td><strong>Main Effect:</strong> Level of Involvement</td>
<td>5.44 (1.54) {72}</td>
<td>4.15 (1.92) {142}</td>
</tr>
</tbody>
</table>

**Panel B: Results of ANOVA Testing**

<table>
<thead>
<tr>
<th>Sum of Squares</th>
<th>d.f.</th>
<th>Mean Square</th>
<th>F-Ratio</th>
<th>p-value</th>
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<tbody>
<tr>
<td>Corrected Model</td>
<td>415.41</td>
<td>3</td>
<td>138.47</td>
<td>183.34</td>
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<tr>
<td>Intercept</td>
<td>2,417.11</td>
<td>1</td>
<td>2,417.11</td>
<td>3,200.39</td>
</tr>
<tr>
<td>IAF Reporting Structure</td>
<td>230.78</td>
<td>1</td>
<td>230.78</td>
<td>305.57</td>
</tr>
<tr>
<td>Level of Involvement</td>
<td>2.69</td>
<td>1</td>
<td>2.69</td>
<td>3.56</td>
</tr>
<tr>
<td>Involvement x Reporting</td>
<td>169.84</td>
<td>1</td>
<td>169.84</td>
<td>224.87</td>
</tr>
<tr>
<td>Error</td>
<td>104.23</td>
<td>138</td>
<td>0.76</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>2,964.82</td>
<td>142</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrected Total</td>
<td>519.63</td>
<td>141</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Panel C: Results of Hypotheses Testing**

\[(\text{ACBOD x Low - CFO x Low}) = \text{Difference}\]

\[
(6.64 - 1.90) = 4.74
\]

\[(\text{ACBOD x High - CFO x High}) = \text{Difference}\]

\[
(4.17 - 3.81) = 0.36
\]

**Test for Significance**

\[
(4.74 - 0.36) = 4.38
\]

<table>
<thead>
<tr>
<th>t-Statistic</th>
<th>p-value</th>
<th>(4.38 &gt; 0)</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.95</td>
<td>&lt;.01</td>
<td></td>
</tr>
</tbody>
</table>

**Results**

The direction of differences-in-differences and significance level support H2.
Table 4 – Analysis of Debriefing Questions

1. How qualified are you to evaluate the design of internal controls related to the financial reporting modules that were implemented in the case? (1 = totally unqualified, 4 = moderately qualified, 7 = very qualified)

Overall mean (standard deviation) = 4.41 (1.51)

<table>
<thead>
<tr>
<th></th>
<th>CFO x Low</th>
<th>CFO x High</th>
<th>ACBOD x Low</th>
<th>ACBOD x High</th>
<th>F-ratio</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4.19</td>
<td>≈ 4.59</td>
<td>≈ 4.54</td>
<td>≈ 4.34</td>
<td>0.51</td>
<td>.67</td>
</tr>
</tbody>
</table>

2. How qualified are you to test the effectiveness of internal controls related to the financial reporting modules that were implemented in the case? (1 = totally unqualified, 4 = moderately qualified, 7 = very qualified)

Overall mean (standard deviation) = 3.27 (1.19)

<table>
<thead>
<tr>
<th></th>
<th>CFO x Low</th>
<th>CFO x High</th>
<th>ACBOD x Low</th>
<th>ACBOD x High</th>
<th>F-ratio</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3.33</td>
<td>≈ 3.12</td>
<td>≈ 3.35</td>
<td>≈ 3.26</td>
<td>0.27</td>
<td>.84</td>
</tr>
</tbody>
</table>

3. To what extent would you directly involve information technology (IT) specialists who work for your CPA firm to help you in evaluating the design of internal controls related to the financial reporting modules that were implemented in the case? (1 = I would not involve the IT specialists at all, 7 = I would have the IT specialists perform all of the work)

Overall mean (standard deviation) = 1.44 (0.71)

<table>
<thead>
<tr>
<th></th>
<th>CFO x Low</th>
<th>CFO x High</th>
<th>ACBOD x Low</th>
<th>ACBOD x High</th>
<th>F-ratio</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.31</td>
<td>≈ 1.44</td>
<td>≈ 1.49</td>
<td>≈ 1.51</td>
<td>0.61</td>
<td>.61</td>
</tr>
</tbody>
</table>

4. To what extent would you directly involve information technology (IT) specialists who work for your CPA firm to help you in testing the effectiveness of internal controls related to the financial reporting modules that were implemented in the case? (1 = I would not involve the IT specialists at all, 7 = I would have the IT specialists perform all of the work)

Overall mean (standard deviation) = 3.11 (1.30)

<table>
<thead>
<tr>
<th></th>
<th>CFO x Low</th>
<th>CFO x High</th>
<th>ACBOD x Low</th>
<th>ACBOD x High</th>
<th>F-ratio</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3.22</td>
<td>≈ 3.18</td>
<td>≈ 3.00</td>
<td>≈ 3.06</td>
<td>0.22</td>
<td>.88</td>
</tr>
</tbody>
</table>
5. How would you characterize the Internal Audit Function’s objectivity with regard to helping you to evaluate the design of internal controls related to the new financial accounting modules? (1 = very low, 4 = moderate, 7 = very high)

Overall mean (standard deviation) = 4.19 (2.06)

<table>
<thead>
<tr>
<th>CFO x Low</th>
<th>CFO x High</th>
<th>ACBOD x Low</th>
<th>ACBOD x High</th>
<th>F-ratio</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.47</td>
<td>&gt; 1.65</td>
<td>&lt; 6.51</td>
<td>&gt; 4.97</td>
<td>154.35</td>
<td>&lt;.01</td>
</tr>
</tbody>
</table>

6. How would you characterize the Internal Audit Function’s objectivity with regard to helping you to test the effectiveness of internal controls related to the new financial accounting modules? (1 = very low, 4 = moderate, 7 = very high)

Overall mean (standard deviation) = 4.22 (2.02)

<table>
<thead>
<tr>
<th>CFO x Low</th>
<th>CFO x High</th>
<th>ACBOD x Low</th>
<th>ACBOD x High</th>
<th>F-ratio</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.56</td>
<td>&gt; 1.82</td>
<td>&lt; 6.46</td>
<td>&gt; 4.86</td>
<td>115.75</td>
<td>&lt;.01</td>
</tr>
</tbody>
</table>

7. How would you characterize the Internal Audit Function’s competence with regard to helping you evaluate the design of internal controls related to the new financial accounting modules? (1 = very low, 4 = moderate, 7 = very high)

Overall mean (standard deviation) = 5.20 (1.78)

<table>
<thead>
<tr>
<th>CFO x Low</th>
<th>CFO x High</th>
<th>ACBOD x Low</th>
<th>ACBOD x High</th>
<th>F-ratio</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.61</td>
<td>&lt; 6.06</td>
<td>≈ 6.11</td>
<td>≈ 6.09</td>
<td>119.59</td>
<td>&lt;.01</td>
</tr>
</tbody>
</table>

8. How would you characterize the Internal Audit Function’s competence with regard to helping you to test the effectiveness of internal controls related to the new financial accounting modules? (1 = very low, 4 = moderate, 7 = very high)

Overall mean (standard deviation) = 5.25 (1.73)

<table>
<thead>
<tr>
<th>CFO x Low</th>
<th>CFO x High</th>
<th>ACBOD x Low</th>
<th>ACBOD x High</th>
<th>F-ratio</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.81</td>
<td>&lt; 5.97</td>
<td>≈ 6.16</td>
<td>≈ 6.08</td>
<td>97.14</td>
<td>&lt;.01</td>
</tr>
</tbody>
</table>

9. With regard to designing internal controls for the financial accounting modules during the implementation process, how would you assess the internal audit function’s competence (1 = very low, 4 = moderate, 7 = very high)

Overall mean (standard deviation) = 5.22 (1.79)

<table>
<thead>
<tr>
<th>CFO x Low</th>
<th>CFO x High</th>
<th>ACBOD x Low</th>
<th>ACBOD x High</th>
<th>F-ratio</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.69</td>
<td>&lt; 6.06</td>
<td>≈ 6.08</td>
<td>≈ 6.11</td>
<td>98.82</td>
<td>&lt;.01</td>
</tr>
</tbody>
</table>
10. Given the degree of involvement the IAF had in designing the internal controls related to the newly implemented financial accounting modules, I think that the Board of Directors (Chief Finance Officer) believed that the IAF’s future objectivity in evaluating the effectiveness of these internal controls would be: (1 = very low, 4 = moderate, 7 = very high)

Overall mean (standard deviation) = 4.62 (2.09)

<table>
<thead>
<tr>
<th>CFO x Low</th>
<th>CFO x High</th>
<th>ACBOD x Low</th>
<th>ACBOD x High</th>
<th>F-ratio</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.53</td>
<td>&gt; 2.97</td>
<td>&lt; 6.43</td>
<td>&gt; 2.34</td>
<td>266.44</td>
<td>&lt; .01</td>
</tr>
</tbody>
</table>

11. With regard to designing internal controls for the financial accounting modules during the implementation process, I think that the Audit Committee of the Board of Directors (Chief Finance Officer) believed that the IAF’s competence was: (1 = very low, 4 = moderate, 7 = very high)

Overall mean (standard deviation) = 5.24 (1.83)

<table>
<thead>
<tr>
<th>CFO x Low</th>
<th>CFO x High</th>
<th>ACBOD x Low</th>
<th>ACBOD x High</th>
<th>F-ratio</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.61</td>
<td>&lt; 6.21</td>
<td>≈ 6.14</td>
<td>≈ 6.06</td>
<td>110.92</td>
<td>&lt; .01</td>
</tr>
</tbody>
</table>

12. With regard to ensuring that the internal controls for the financial accounting modules would be properly designed during the implementation process, I think that the Board of Directors believed that upper management’s competence in this area was: (1 = very low, 4 = moderate, 7 = very high)

Overall mean (standard deviation) = 4.78 (2.21)

<table>
<thead>
<tr>
<th>CFO x Low</th>
<th>CFO x High</th>
<th>ACBOD x Low</th>
<th>ACBOD x High</th>
<th>F-ratio</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.56</td>
<td>≈ 5.82</td>
<td>≈ 5.57</td>
<td>&gt; 2.14</td>
<td>40.94</td>
<td>&lt; .01</td>
</tr>
</tbody>
</table>

Notes:

CFO = Chief Finance Officer

ACBOD = Audit Committee of the Board of Directors

Comparisons among treatment means were conducted using Scheffe’s multiple pairwise testing (alpha = .01)
Table 5 – Supplemental Regression Analyses

Panel A: Composite Indices

The two debriefing items reflecting the external auditor’s assessment of the IAF’s objectivity with regard to evaluating (see item #5, Table 4) and testing (see item #6, Table 4) the design of internal controls related to the new financial accounting modules were averaged into a single “Objectivity” index ($r = .98$, $p < .01$)

The two debriefing items reflecting the external auditor’s assessment of the IAF’s competency with regard to evaluating (see item #7, Table 4) and testing (see item #8, Table 4) the design of internal controls related to the new financial accounting modules were averaged into a single “Competency” index ($r = .96$, $p < .01$)

Panel B: Regression without the Interaction Term

Dependent Variable = Reliance Index

Adjusted $R^2 = .74$, $F = 206.20$, $p < .01$

<table>
<thead>
<tr>
<th>Beta Coefficient</th>
<th>t-statistic</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objectivity Index</td>
<td>.40</td>
<td>9.16</td>
</tr>
<tr>
<td>Competency Index</td>
<td>.70</td>
<td>16.12</td>
</tr>
</tbody>
</table>

Panel C: Regression with the Interaction Term

Dependent Variable = Reliance Index

Adjusted $R^2 = .79$, $F = 175.06$, $p < .01$

<table>
<thead>
<tr>
<th>Beta Coefficient</th>
<th>t-statistic</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objectivity Index</td>
<td>-.10</td>
<td>-0.49</td>
</tr>
<tr>
<td>Competency Index</td>
<td>.43</td>
<td>3.65</td>
</tr>
<tr>
<td>Interaction Term</td>
<td>.62</td>
<td>2.46</td>
</tr>
</tbody>
</table>
Figure 1 – Graph of Expected Interaction of Reporting Relationship and Involvement Level on External Auditors’ Reliance on the Work of Internal Audit Function

Interaction Hypothesis based on Prior Literature (H1)

Notes:

1) Based on prior literature and theory, we predict that the issue of IAF involvement in the low involvement condition likely will focus attention on the reporting relationship; thus, we expect a small decrease in reliance in this condition when the IAF reports to the CFO, compared to the ACBOD.

2) When the IAF’s involvement is relatively high, the objectivity compromise related to involvement is expected to trigger an associated objectivity concern about the reporting relationship. Therefore, we expect a relatively large decrease in reliance when the IAF reports to the CFO.
Figure 2 – Graph of Expected Interaction of Reporting Relationship and Involvement Level on External Auditors’ Reliance on the Work of Internal Audit Function

Interaction Suggested by Focus Group (H2)

Notes:

1) When making the reliance decision, the focus group indicated that it would place substantially more weight on the IAF's competency in designing the internal controls related to the financial accounting modules, relative to objectivity concerns arising from reporting to the CFO or high prior non-audit involvement. Thus, we have depicted a general pattern under the assumption of higher competency weight, while understanding that we have no way of knowing \textit{a priori} precisely how much more weight to assign to competency relative to objectivity.

2) The reliance results in the ACBOD condition (low and high involvement) are the same as shown on Figure 1, as the focus group gave no reasons to expect otherwise.

3) When involvement is low, we predict a relatively large difference in reliance between the ACBOD and CFO conditions due primarily to a negative competency belief (second-order derived from the CFO), which is expected to place downward pressure on reliance. As a result, the distance between the two means (ACBOD and CFO) is diverging.

4) When involvement is high, we predict a relatively small difference in reliance between the ACBOD and CFO conditions primarily due to a positive competency belief (second-order derived from the CFO), which is expected to place upward pressure on reliance.
Figure 3 – Graph of Realized Interaction of Reporting Relationship and Involvement Level on External Auditors’ Reliance on the Work of Internal Audit Function

Extent of Reliance

Notes:

1) Independent Variable: Reporting Relationship: The Internal Audit Function either reported to the Audit Committee of the Board of Directors (ACBOD) or the Chief Financial Officer (CFO)

2) Independent Variable: Degree of internal auditor involvement in designing internal controls related to recently implemented financial reporting modules: Low Involvement or High Involvement

3) Dependent Variable: Extent of reliance external auditors will place on the Internal Audit Function with regard to having the internal auditors evaluate the design and test the effectiveness of internal controls related to recently implemented financial accounting modules.