

Internal Auditor Involvement In Internal Control System Design: Is Objectivity Impaired?

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Abstract

Research in behavioral decision making suggests that internal auditors who are involved in the design of a particular internal control system may be reluctant to find fault with the system, and in turn, their objectivity may be impaired. The purpose of our study was to test this assertion. We found, contrary to the assertion, that internal auditors who participated in the design of a particular system were able to maintain their objectivity.

Introduction

Objectivity is a key attribute for internal auditors. In a report focusing on public companies, the U.S. National Commission on Fraudulent Financial Reporting asserted that "all public companies must have an effective and objective internal audit function" (National Commission on Fraudulent Financial Reporting, 1987, p. 11). Moreover, professional standards in the U.S and in the U.K. mandate objectivity on the part of internal auditors (Institute of Internal Auditors, 1981, p. 100-2, Comptroller General of the United States, 1981, p. 18, and Chartered Institute of Public Finance and Accountancy).

One of the potential impairments to objectivity is the performance of duties that conflict with the internal audit role. In a study where external auditors assessed internal audit strength, Messier and Schneider (1988) found that "freedom from conflicting duties" was ranked fourth among 26 attributes involving all aspects of internal auditing (not only objectivity). Schneider (1984) also found that freedom from conflicting duties is an important element of perceived internal audit objectivity.

A commonly cited example of conflicting duties is auditing a system or program for which one was previously involved in designing or had some other decision-making responsibility. For instance, Ward and Robertson (1980, p. 66) suggest that one of the steps in considering objectivity is to "review the internal auditors' freedom from operational responsibilities". In discussing internal auditing in government agencies, Rine (1975, p.84) cites "previous involvement in a decision-making or management capacity in the operations of the governmental entity or program being audited" as an impairment to objectivity. The Institute of Internal Auditors

(IIA) standards, the General Accounting Office (GAO) standards, and the Chartered Institute of Public Finance and Accountancy (CIPFA) standards all explicitly mention this type of conflict.

The IIA standards indicate that:

Designing, installing, and operating systems are not audit functions ... Performing such activities is presumed to impair audit objectivity (Institute of Internal Auditors, 1981, p. 100-2).

Further, the GAO standards indicate that:

There are circumstances in which auditors cannot be impartial ... These circumstances include ... Previous involvement in a decisionmaking or management capacity that would affect current operations of the entity or program being audited (Comptroller General of the United States, 1981, p. 18).

Additionally, the CIPFA standards indicate that:

Internal audit should not be directly responsible for the development or implementation of new systems, or engage in any other activity which they would normally review and appraise since this could compromise their independence (Chartered Institute of Public Finance and Accountancy, 1979, p. 7).

Buttery and Simpson (1986) point out that "it is quite common to find audit sections involved in ... designing financial systems and in many other ways becoming directly involved in systems which they should be

responsible for reviewing" (p. 8). There is some empirical evidence to indicate that internal auditors sometimes do expose themselves to these types of conflicting duties. In a study by Clay and Haskin (1981), 5% of the chief financial officers surveyed responded that their internal auditors develop or install procedures that they would normally audit. In a recent survey of internal audit directors, Greenberg and Murphy (1989) report that, on average, 14.2% of their internal audit staff time is spent on systems development activities. In fact, Blevins (1989) warns against a growing trend in internal auditing which has become known as "proactive auditing". One of the tenets of proactive auditing is that "the function of internal auditing should be expanded to include management action such as designing operating systems . . ." (Blevins, 1989, p. 33). For instance, Margerison (1986) advocates that "auditors will need to widen their skills away from the purely technical areas towards a more team-orientated proactive role where they work alongside managers and other staff in order to develop strengths rather than expose weaknesses" (p. 2).

Although it is commonly accepted that the design and subsequent audit of an area impairs objectivity, no research has been conducted to empirically test this assertion. The objective of this study is to provide empirical evidence as to whether involvement in internal control system design affects subsequent audit decisions.

Related Literature

We first discuss research on decision making in general in order to provide a basis as to why objectivity may be impaired by involvement in the design of an internal control system. Studies on decision making have found that choosing an alternative affects the objectivity of decisions that are made about that alternative. Staw (1976) performed an early study in this area that is representative of other work that has been done. He asked one half of his subjects to choose a project that they would ostensibly manage, and he told the other half that they were taking over a project chosen by someone else. Next, subjects received feedback indicating that (after their first year of involvement with the project) costs were running way over budget. Subjects were asked if they would like to invest additional funds into the project. Staw found that subjects who chose the project were much more willing to invest additional funds as opposed to subjects who took over the project. The author reasoned that responsibility for choosing a project leads to commitment to seeing the project through to a successful completion (see also Staw and Ross, 1987).

Research findings (Fox and Staw, 1979, Staw, 1981, and Caldwell and O' Reilly, 1982) suggest that individuals become committed to projects that they have chosen in order to gain the approval of others (e.g., their

superiors). Individuals will want to show others that they are capable of choosing and managing a successful project. Hence, they will be reluctant to find fault with projects that they have chosen. Attribution theory (Kelley, 1971) suggests that individuals will become committed to projects that they have chosen as part of a self-serving bias (Zuckerman, 1979). They will be motivated to support such projects in order to achieve certain rewards (e.g., praise, increased pay and promotion). Furthermore, they will be inclined to take credit for favorable project outcomes and to explain away unfavorable project outcomes. Individuals may explain away unfavorable project outcomes by attributing them to causes that are beyond their control (Leatherwood and Conlon, 1987).

The research discussed above can be applied to situations where internal auditors design a control system and then subsequently audit that system. According to attribution theory, internal auditors should be inclined to evaluate work that they have performed more favorably than work that has been performed by others. They also should be inclined to search for potential problems in areas where they have not performed work previously.

While no empirical accounting studies have addressed the issue of whether involvement in internal control design biases subsequent audit work, several studies have addressed related issues. Joyce (1976) and Gaumnitz et al. (1982) both examined the effect that internal controls have on auditors' subsequent time allocations, but neither study placed subjects in roles involving internal control design. Church (1991) examined the effect that commitment to a prior belief has on auditors' allocations of effort. However, he did not investigate whether such allocations would be affected by auditors' involvement in prior work. Plumlee (1985) tested the effects of auditors' roles in internal control design, but he did not examine whether subsequent audit work would be affected. Instead, he tested subjects' memory recall abilities (i.e., the richness of a subject's mental representation for the strengths and weaknesses of internal control systems).

Several researchers (e.g., Knapp, 1985, and McKinley, Pany, and Reckers, 1985) have investigated the relationship between participation in internal control design (or management advisory services, in general) and auditor objectivity, but all have focused on objectivity at the firm level, rather than at the individual level. Their emphasis has been at the firm level because they have examined objectivity in CPA firms. In CPA firms, those who typically design internal control systems (members of a management advisory services group) are not the ones who audit them. The focus of our study is on internal auditing, where, as noted earlier, individual internal audit staff members sometimes find themselves partici-

pating in audits of systems that they helped design. Specifically, we investigate whether individual internal auditors are motivated to search for problems in a particular area depending on whether they have had any prior responsibility or involvement in that area.

Methodology

Experimental Design

The experimental design involved two treatment groups and a control group. One treatment group (the A/R group) played a role in designing internal controls for an accounts receivable system. They also evaluated internal controls for an accounts payable system designed by someone else. Another treatment group (the A/P group) did the reverse. A third group (the control group) merely evaluated internal controls for both systems.

All subjects were then told that both internal control systems were implemented and that the next quarterly balance sheet revealed a current ratio which appeared unusually high. Because the controls for receivables and payables were new, subjects were told to focus on errors or irregularities involving one or both of these accounts. They were asked to allocate 15 hours to investigate either or both of the accounts in question.

Hypothesis

Our hypothesis was that auditors who had a role in designing a system for a particular account would allocate less audit effort to that account than auditors who had no role in designing that system. Formally stated,

H_0 : The allocation of audit effort will not differ among the three groups.

H_a : The A/R group will allocate the least audit effort to receivables and the A/P group will allocate the least audit effort to payables.

Subjects

The subjects consisted of 51 internal auditors who worked for 21 different organizations located in a large U.S. city. We obtained the subjects from the local chapter of The Institute of Internal Auditors and from various personal contacts in local organizations.

Our subjects averaged 4.9 years of internal auditing experience, with the vast majority (42 out of 50) having at least one year (one subject did not respond). Since 24 subjects had some public accounting experience, the average amount of auditing (internal plus external) experience was 6.3 years and 44 out of 50 had been an auditor for at least one year. The overwhelming majori-

ty indicated they had at least some experience with both accounts receivable and accounts payable -- 45 out of 51 (44 out of 51) had experience with designing or evaluating internal controls for receivables (payables). The subjects appear to have a proper level of experience to complete the experimental tasks.

Procedures

We discuss in detail the research instrument that was given to subjects in the A/R group. This is intended to simplify the discussion; however, it should be kept in mind that we gave parallel questionnaires to the A/P group. Differences that distinguished the control group questionnaires are discussed later.

All subjects were told to assume they were internal auditors for a hypothetical U.S. corporation that was redesigning some of its internal controls. The A/R group was informed that they were participating in the redesign of controls for receivables. Considering external validity, we ideally would have asked for these redesigned controls in an open-ended manner. However, as it will become clear later in the paper, internal validity required that these redesigned controls for receivables be comparable in strength to the internal controls for payables that were designed by others. To ensure this, we had to constrain subjects' roles in the internal control design to a limited set of choices. Hence, subjects were instructed to select a control system from among five alternatives that were presented. The questionnaire stated that cost/benefit considerations had narrowed the alternatives down to five. These alternatives are shown in the top half of the Appendix. We chose six internal control features commonly discussed in auditing textbooks (e.g., Wallace, 1986, and Kell et al., 1986) to describe each alternative. So as not to make the decision trivial, we placed some strong and some weak features within each alternative. Indeed, in examining the subjects' actual choices, no one alternative completely dominated the selections.

Asking subjects to choose a system should cause them to become somewhat committed to that system (Staw, 1976). That is, it may cause them to be reluctant to find fault with the system. To make our manipulation of commitment as strong as possible, subjects also were asked to provide written justification for their selections, and they were informed that their decisions would be discussed in a group setting following the experiment. For this reason, one of the authors personally administered the questionnaires in groups having at least two subjects. Church (1991) used similar procedures to effectively manipulate commitment in an auditing setting.

After the subjects wrote down reasons justifying their selections, they were informed that their decisions were

implemented. They were then given some internal controls pertaining to accounts payable and told that these controls had just been developed and implemented by company management. The accounts payable controls are shown in column E on the bottom half of the Appendix. We chose the column E controls based on the results of a pre-test.(1) Subjects in our pre-test gave the highest aggregate evaluation of internal control strength to column E. We chose the strongest controls so as not to bias their audit effort allocation between receivables and payables. That is, since subjects would be choosing what they perceive to be the strongest of the five receivables systems, we wanted the payables system to be perceived as roughly similar in strength.

After selecting the receivables controls and receiving information about the payables controls, the subjects were told that an examination of the company's quarterly financial statements revealed an unusually high current ratio. Subjects were then given the following instructions:

Since the internal controls for accounts receivable and accounts payable are new, you suspect that errors or irregularities may have caused one or both of these accounts to be misstated. Because of time constraints, you have decided to allocate only 15 hours to investigate either or both of the accounts in question.

Subjects were then asked to allocate the 15 hours between the two accounts (or solely to one of them).

As we will discuss in more detail later, in order to compare the perceived internal control strengths, subjects were then asked to evaluate the internal control strength of the accounts payable system,(2) which was designed by someone else. Evaluations were made on a five-point scale. Since factors other than internal control strength could influence the audit allocations, we also asked questions regarding:

- * whether it typically takes more time to audit receivables vs. payables;
- * which of the two accounts are generally more likely to be misstated;
- in general, the one most likely cause of a current ratio problem as described in our scenario;
- * past experience in designing or evaluating receivables systems;
- * past experience in designing or evaluating payables systems;

Parallel questionnaires were given to the A/P group -- they played a role in selecting a system for payables and were informed about the controls for receivables. The control group had no decision-making role regarding either receivables or payables. They merely received information about the two strongest systems as identified by our pre-test (i.e., column C in the top half of the

Appendix and column E in the bottom half). After they allocated the 15 audit hours, they provided evaluations (on the same five-point scale as the treatment groups used) about both control systems. Each treatment group contained 18 subjects and the control group had 15 subjects.

Results

Manipulation Check

To determine whether our efforts to induce a heightened level of commitment (as discussed earlier) were successful, subjects were asked whether they believed they would need to justify their selection of an internal control system. While three subjects replied that they were not sure, 27 out of the remaining 33 responded that they did believe they would need to justify their selection.(3),(4) Thus, our asking the subjects to provide written justification and informing them about a group discussion of their decisions appears to have induced the desired heightened level of commitment.(5)

Preliminary Analysis Between Groups

Before testing our research hypothesis, we examine whether our three groups are similar in terms of experience and level of commitment to their decisions. Table 1 reports data related to these two issues. None of the differences are significant even at the .10 level. The first five rows of the data on experience indicate that general auditing experience is comparable among the three groups. The following two rows on experience reveal that the auditing experiences most relevant to this task are comparable across groups. The row of data on commitment reveals comparable percentages of A/R group and A/P group subjects with "commitments" to their decisions. Hence, our data indicate that we cannot attribute subjects' audit effort allocations to any differences in auditing experience, task-related experience, or levels of commitment.

Main Findings

Since each subject's allocation of audit hours to receivables and payables summed to 15, we only needed to analyze the allocations to one of these accounts. We chose to focus on the allocation to receivables. Table 2 shows that the A/R group allocated an average of 8.9 hours to receivables, the A/P group allocated an average of 8.2 hours, and the control group allocated an average of 8.3 hours. These differences were not statistically significant ($F = .557$, $p = .58$).

On average, all three groups allocated a majority of hours to receivables. These averages were not caused by just a few subjects allocating a disproportionately high amount to receivables. As can be seen from the distri-

Table 1
Characteristics of Subjects by Groups

	A/R Group	A/P Group	Control Group
<u>Experience</u>			
1. Years of internal audit experience.	5.0	4.6	5.1
2. Percentage having ≥ 1 year internal audit experience.	78%	89%	86%
3. Years of internal and external (total) audit experience.	6.2	6.2	6.7
4. Percentage having ≥ year total audit experience.	78%	94%	93%
5. Percentage having public accounting experience >	44%	39%	64%
6. Percentage having experience with accounts receivable.	83%	94%	87%
7. Percentage having experience with accounts payable.	78%	94%	87%
<u>Commitment</u>			
Percentage believing they would need to justify their choices.	82%	81%	not applicable

* Respondents who stated they were unsure were deleted from these analyses.

Note: None of the differences in this table are statistically significant at the .10 level.

Table 2
Allocation of Audit Hours

	A/R Group	A/P Group	Control Group
Avg. # hours allocated to receivables.	8.9	8.2	8.3

# subjects allocating more hrs. to receivables than payables.	14 (78%)	13 (72%)	6 (40%)
# subjects allocating more hrs. to payables than receivables.	4 (22%)	5 (28%)	3 (20%)
# subjects allocating 7.5 hrs. to both receivables and payables.	0	0	6 (40%)

bution below the dotted line in Table 2, a large percentage of subjects in all three groups allocated more hours to receivables than payables.

Table 3 provides some insight into the underlying reasons for subjects' allocations. Each of the three panels of Table 3 provides a distribution of responses to questions that were asked after subjects had completed their audit effort allocations. We first analyze the control group responses before turning to the treatment groups. Our analysis of Table 3 will involve comparing beliefs about payables versus receivables, and so we will focus on the first two rows of all three panels.

Control Group

To establish that the control group perceived the receivables system (column C in the top portion of the Appendix) as comparable in strength to the payables system (column E in the bottom portion of the Appendix), we compared their mean evaluations. The group's mean evaluation for receivables was 2.40 (on a scale of 1=very weak to 5=very strong) and for payables was

2.33. A two-tailed t-test and Mann-Whitney U test were both not significant even at levels of .10. Therefore, the control group's allocation of a majority of hours to receivables should not be attributed to a perception of relatively weak internal controls for receivables.

Possible reasons for the control group's allocations are suggested from a closer inspection of Table 3: subjects believed that receivables generally take more time to audit by a margin of 7 to 4, they felt that receivables are generally more likely to be misstated by a margin of 5 to 2, and they thought that the most likely cause of an unusually high current ratio was related to receivables by a margin of 9 to 3. Thus, due to time requirements and susceptibility to errors/irregularities, our control subjects indicate that internal auditors would generally allocate more time to auditing receivables than payables.

A/R Group

We hypothesized that the A/R group, having played a role in selecting the accounts receivable system that was implemented, would allocate the least amount of

Table 3
Responses to General Questions About Receivables and Payables

<u>Panel A</u>			
Responses to: Which account generally takes more time to audit?			
	A/R	A/P	Control
	<u>Group</u>	<u>Group</u>	<u>Group</u>
Receivables take longer.	10	3	7
Payables take longer.	3	9	4
Both take about the same time.	5	6	4

<u>Panel B</u>			
Responses to: Which account is generally more likely to be misstated?			
	A/R	A/P	Control
	<u>Group</u>	<u>Group</u>	<u>Group</u>
Receivables are more likely.	8	3	5
Payables are more likely.	1	9	2
Both are equally likely.	9	6	8

<u>Panel C</u>			
Responses to: Which is the most likely cause of an unusually high current ratio?			
	A/R	A/P	Control
	<u>Group</u>	<u>Group</u>	<u>Group</u>
Cause relates to receivables.	11	11	9
Cause relates to payables.	6	7	3
Cause could relate to either.	1	0	3

Note: The numbers in each panel represent the number of responses in that category.

time, of all three groups, to audit receivables (and, consequently, the most time to audit payables). As pointed out earlier, however, the A/R group’s allocations were not significantly different from those of the other two groups. We can partially explain the A/R group’s allocations using Table 3 in the same manner as above: subjects believed that receivables take more time to audit by a margin of 10 to 3, they felt that receivables are generally more likely to be misstated by a margin of 8 to 1, and they thought that the most likely cause of an unusually high current ratio was related to receivables by a margin of 11 to 6. These beliefs are similar to those of the control group (see Table 3). Thus, like the control group, these beliefs apparently contributed to the A/R group’s allocation of more hours to receivables than payables. Another factor contributing to the A/R group allocating more hours to receivables than payables seems to be their relatively strong evaluation of the accounts payable system. The A/R group’s evaluation of the accounts payable system (2.8 on the five-point scale) was higher than the control group’s evaluation of accounts payable at a marginally significant level ($p=.07$ using a two-tailed t-test; $p=.10$ using a two-tailed Mann-Whitney U test). This comparison also suggests a possible explanation for why the A/R group did not allocate the most time (of all three groups) to audit accounts payable, as hypothesized. That is, any effects

that may have been produced from being involved in the design of the receivables system were overshadowed by subjects’ beliefs about the relative strength of the payables system controls.

A/P Group

We hypothesized that the A/P group, having played a role in selecting the accounts payable system that was implemented, would allocate the least amount of time, of all three groups, to audit payables (and, consequently, the most time to audit receivables). Although the A/P group allocated less time to payables than receivables, the allocations were not significantly different from the other two groups. The A/P group’s evaluation of the receivables system, on average (2.4 on the five point scale), was the same as the control group, and their responses as to the most likely cause of an unusually high current ratio (see panel C of Table 3) were similar to the other two groups (by a margin of 11 to 7, they thought that the most likely cause was related to receivables). However, their responses as to how much time it takes to audit receivables and payables (see panel A of Table 3) and which account is more likely to be misstated (see panel B of Table 3) are markedly different from the other two groups: subjects believed that payables take more time to audit by a margin of 9 to 3,

and they felt that payables are generally more likely to be misstated by the same 9 to 3 margin. These beliefs suggest a possible explanation for why the A/P group did not allocate the most time (of all three groups) to audit accounts receivable, as hypothesized. That is, any effects that may have been produced from being involved in the design of the payables system were offset by subjects' beliefs about time requirements and likelihoods of account misstatements.

Discussion of Results

The results discussed above indicate that subjects' allocations of audit hours were not affected by their prior involvement in systems design. Differences emerged between groups, however, as to subjects' beliefs about time requirements and susceptibility of accounts to errors/irregularities (see Table 3, Panels A and B). These differences may be attributable to individual characteristics or to an unexpected treatment effect. We shall now discuss both of these possibilities.

If the differences between groups are attributable to individual characteristics, then one cannot be certain that prior involvement in systems design had no effect on subsequent audit work. The individual characteristics could have offset any effects that may have been produced by the treatments. Future research must resolve this issue. A two-stage study would be required to control for individual differences, assuming such differences are expected. In the first stage, subjects' beliefs and attitudes would be identified, and in the second stage, knowledge of these beliefs and attitudes would be used to assign subjects to experimental groups. We did not follow such an approach because we did not have any a priori reason to expect differences in individual characteristics.(6)

If differences between groups are attributable to an unexpected treatment effect, then prior involvement in systems design does not appear to affect subsequent audit work. This may be explained as follows. Panels A and B of Table 3 indicate that subjects in the A/P group thought payables generally take longer to audit than receivables and also felt that payables are more likely to be misstated than receivables. Subjects in the A/R group believed just the opposite. These differences may have occurred because of the experimental task itself. Focusing more time and attention on a particular system (i.e., whichever system subjects were responsible for choosing internal controls), could have heightened subjects' concerns about audit time and likely misstatements for that system in general. If this is the case, we must reconcile the Table 3 findings with the fact that the allocations of audit hours did not differ significantly among groups. A plausible explanation is that despite their beliefs about time requirements and the likelihood of misstatements, subjects were sensitive to having been

involved in the design of an internal control system, and therefore tried to maintain their own objectivity by not having these beliefs affect their audit allocation decisions.

Although we could have avoided the possibility of an unexpected treatment effect by asking subjects the questions in Table 3 prior to the experiment, this would have created another more serious problem. Asking subjects to state, up front, their beliefs about time requirements and the likelihood of misstatements would probably have affected their allocation of audit hours.(7) Therefore, we chose to ask the questions in Table 3 after subjects had completed the experimental materials to ensure that our primary variable of interest would not be confounded by subjects' responses to these questions.

In assessing whether the differences in Panels A and B of Table 3 are attributable to individual characteristics or to an unexpected treatment effect, we tend to downplay the plausibility of the latter explanation. While a comparison of the A/P group with the control group reveals differences, we would also expect such differences between the A/R group and the control group if in fact there was an unexpected treatment effect. The lack of significant differences between the A/R and control group responses leads us to discount the possibility of an unexpected treatment effect.

An explanation of our results could be that subjects did not let their involvement in internal control system design affect their audit effort allocations because they adhered to the standards of internal audit objectivity. This explanation would be consistent with either of the arguments -- "individual characteristics" or "unexpected treatment effect" -- posited above. As we stated earlier regarding the former, perhaps individual subjects' beliefs about audit time requirements and account misstatements contributed to not finding the hypothesized lack of objectivity. Similarly, auditors' beliefs that they should adhere to the internal audit standards could have partially, or perhaps fully, accounted for the lack of significant differences in audit effort allocations. Regarding the "unexpected treatment effect" possibility, recall that we reconciled the Table 3 group differences with the not significantly different audit effort allocations by arguing that despite their beliefs, subjects may have recognized that these beliefs should not affect their objectivity. Hence, our finding of non-significant differences in audit effort allocations, despite subjects' commitments to particular systems arising from prior design involvement, may be attributable to subjects' adherence to internal audit standards of objectivity. The following section analyzes this possibility.

Comparison with Students

To test our theory that the audit effort allocations did

not significantly differ among the three groups because the subjects consciously adhered to internal audit standards, we repeated this experiment with undergraduate auditing students who had no exposure to internal audit standards. These students were, however, taught the basic distinctions between internal and external auditors. In particular, they were made aware of the essential differences relating to independence. A finding of significantly different audit effort allocations among the three student groups(8) would lend evidence to the explanation that our results for the internal auditor subjects were caused by their adherence to internal audit standards of objectivity.

The experiment was administered to the auditing students a week before their final examinations. Thus, they were already taught virtually all of the course content. To ensure that the knowledge levels of each of the three groups were comparable, we assigned subjects to the groups based on our expectations of grades that they would earn in the auditing class. An analysis of actual grades earned confirmed our expectations.(9)

The audit effort allocations made by students in the A/R, A/P, and control groups were in the expected directions and an ANOVA revealed significant differences ($F=3.69$, $p=.03$), suggesting that the manipulation had an effect. To ascertain that these differences are attributable to the treatments rather than subjects' underlying beliefs, we performed the same comparisons as discussed earlier for the auditor subjects. At the .05 level none of the four comparisons involving the internal control strength evaluations were significant and only one of the three comparisons involving time requirements and error susceptibility was significant. Thus, it would appear that involvement in internal control design caused the significant differences in the students' allocations of audit effort. This supports our contention that the non-significant differences found for the audit effort allocations of the internal auditors may be due to the latter's awareness of and adherence to internal audit standards of objectivity.

Conclusion

The purpose of our study was to determine whether internal auditor involvement in systems design affects decisions about subsequent audit work. The allocations of audit hours suggest that involvement in the selection of an accounting system does not affect internal auditors' decisions regarding potential audit work on that system. A plausible explanation is that the internal auditors maintained their objectivity despite their previous involvement in the design of a particular system. This supports the view that internal auditors are true to the ideals of objectivity as it relates to auditing a system for which one has had a previous role designing.

An alternative explanation for the findings discussed above is that the manipulation was not effective. That is, subjects did not perceive the task as involving conflicting duties. We performed additional tests to assess the effectiveness of the manipulation using student subjects. We found that students' allocations of audit hours were affected by their previous involvement in systems design, which suggests that the manipulation was effective. The results for the student subjects may be attributed to their lack of knowledge of the internal audit standards. While the students were made aware of the basic distinctions between internal and external auditors, they were not exposed to the internal audit standards of objectivity. Consequently, their objectivity was impaired.

The findings in this study may provide some comfort for internal auditors, especially in light of the growing trend toward "proactive auditing". The results suggest that internal auditors are cognizant of upholding the internal audit standards of objectivity. The findings in this study also suggest that students may benefit from being exposed to the internal audit standards at some point in their accounting curriculum.

Suggestions For Future Research

As suggested earlier, future research should examine whether differences in individual characteristics could have offset any effects that may have been produced by the treatments. A two-stage study would be required to control for individual differences. In the first stage, subjects' beliefs and attitudes would be identified, and in the second stage, knowledge of these beliefs and attitudes would be used to assign subjects to experimental groups. Future research should also address whether the results of this study can be generalized to internal auditors in other countries.

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Notes

1. We pre-tested the questionnaires for all three groups using nine auditors from a local office of a large accounting firm. This led to only slight changes in the questionnaires.
2. These evaluations were made after the allocation of audit hours so as not to contaminate the allocation.
3. The 15 control subjects did not select control systems, so they were not asked to justify their selections.
4. The results reported below were unchanged when we deleted these six subjects.
5. A second question asked whether they believed they were primarily responsible for the system that was

Appendix
Internal Control System Choices Presented to Treatment Groups

<u>Internal Control Features</u>	Alternative Accounts Receivables Systems				
	<u>A</u> VP-	<u>B</u> VP-	<u>C</u>	<u>D</u> VP-	<u>E</u>
To whom does the customer billing department report?	Sales	Finance	Controller	Finance	Controller
Is there a regular aging of accounts receivable?	No	No	No	Yes	Yes
How often is the gen. ledger compared to the sub. ledger?	Weekly	Monthly	Monthly	Weekly	Quarterly
Are daily reports of issued invoices sent to the acct. dept?	Yes	Yes	No	No	Yes
Are cash collections deposited daily?	No	Yes	Yes	Yes	No
Are the sales invoices prenumbered?	Yes	No	Yes	No	Yes

<u>Internal Control Features</u>	Alternative Accounts Payable Systems				
	<u>A</u> VP-	<u>B</u>	<u>C</u>	<u>D</u> VP-	<u>E</u> VP-
To whom does the purchasing department report?	Operations	Controller	Controller	Finance	Finance
How many signatures are required on checks?	1	1	1	2	2
Does a second voucher clerk validate vouchers?	No	Yes	Yes	No	No
Are daily summaries of vouchers sent to the acctg. dept?	Yes	Yes	No	Yes	No
Are all disbursements (except for petty cash) made by check?	No	No	Yes	Yes	Yes
Are the purchase orders prenumbered?	Yes	Yes	Yes	No	Yes

implemented. Debriefing sessions, however, revealed that several subjects did not clearly understand the second question. Their responses to this question about primary responsibility, therefore, are highly suspect, and as such, we do not report them. Otherwise, subjects seemed to feel the questionnaire was clear and interesting.

6. With large sample sizes, individual differences should be less of a problem. That is, such differences can be expected to randomize across experimental groups as sample size increases.
7. One might also think that we could have used Table 3 responses obtained before the experiment as a basis for assigning subjects to the three groups (i.e., as a blocking factor). However, since we administered questionnaires personally by going to several subjects at a time, the information about all subjects' attitudes could not be obtained until all subjects were visited.
8. There were 15 students in each of the two treatment groups and 13 students in the control group.
9. With an "A" equivalent to a point value of 4.00, both the A/R and A/P groups averaged 3.07, while the control group averaged 3.00. These grade point averages were not significantly different -- an ANOVA revealed a p-value of .97.

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