INFORMATION TO USERS

THE EFFECTS OF REWARD STRUCTURE AND ETHICAL AMBIVALENCE
ON AUDIT STAFF REPORTING BEHAVIOR:
AN EXPERIMENTAL LAB STUDY

(An Abstract of a Dissertation)

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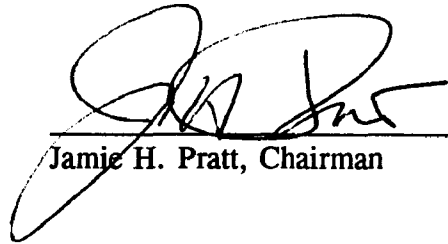
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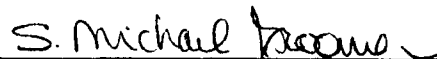
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ABSTRACT

The reward structures of public accounting firms have received limited attention in the behavioral accounting research literature. The goal of this study is to examine the effects of two economic elements of these reward structures on reporting behavior. The study provides a general model that incorporates the independent variables of time budget importance and salary structure, and the psychological construct of ethical ambivalence as a mediator between the independent variables and the dependent variable of reporting behavior. This model is tested in a computerized experiment that involved 124 subjects in a simulated audit task, representative of tasks commonly assigned to audit staff in public accounting firms. The general model is based on a framework that incorporates ethical ambivalence theory and expected utility theory to explain how the conflict resulting from a reward structure that offers high incentives to a staff auditor to meet an unattainable time budget may result in feelings of ethical ambivalence, and how such ambivalence may result in the behaviors of underreporting the number of hours worked and signing off on incomplete audit procedures.

The results of this experiment, generated from a LISREL path analysis, support the predictions of the model. The data show that time budget importance has a positive, significant effect on ethical ambivalence levels, that a straight salary structure has a significantly more positive effect on ethical ambivalence levels than

does an overtime salary structure, and that ethical ambivalence has a positive, significant effect on the tendency to engage in inaccurate reporting behavior.

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CHAPTER 1

INTRODUCTION

The reward structures of public accounting firms have received limited attention in the behavioral accounting research literature (Bamber, 1993). The goal of this study is to examine the effects of two economic elements of these reward structures on reporting behavior. The study provides a general model that incorporates the independent variables of time budget importance and salary structure, and the psychological construct of ethical ambivalence as a mediator between the independent variables and the dependent variable of reporting behavior. This model is based on a framework that incorporates ethical ambivalence theory and expected utility theory to explain how the conflict resulting from a reward structure that offers high incentives to a staff auditor to meet an unattainable time budget may result in feelings of ethical ambivalence.[1] The framework also provides an explanation as to how such ambivalence may result in the reporting behaviors of underreporting hours and signing off on incomplete procedures.[2] Such behaviors preclude audit firm management from obtaining accurate information regarding firm profitability,

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[1]Prior literature documents that unattainable time budgets are becoming more common due to the increasingly competitive nature of the audit profession (Dirsmith et al., 1992; McNair, 1991; McDaniel, 1990; Dirsmith and Covaleski, 1985b; Lightner et al., 1982, 1983).

[2]Ethical ambivalence is a psychological construct that occurs when an organizational reward system supports employee behaviors that conflict with formal firm policy, and also with the expectations of organizational stakeholders (Jansen and von Glinow, 1985). Ethical ambivalence theory is explained in detail in Chapter 2.

employee performance, and audit evidence. As a result, decisions based on such inaccurate or incomplete information may be inferior to better informed decisions. Understanding how the firm's reward structure affects reporting behavior may provide firms with useful information regarding the design of their reward systems. If the reward systems of public accounting firms can be redesigned to motivate audit staff to report performance accurately, then improved profitability may result.

Underreporting creates inaccurate historical time budget information that, in many instances, is used as a basis for future audit planning. When a prior year's time budget is used as a basis for audit scheduling and staff assignment, or as a basis for budgeting audit costs, it is important that the information concerning the attainability of the budget is accurate. Douglas (1977, p. 8) states that two of the most important objectives specified by national CPA firms are to maximize realization rates (dollars billed/dollars charged) and to maximize chargeable hours. When auditors, who are provided with unrealistic time budgets, exceed budget and accurately report their total hours, the result is legitimate chargeable, but often unbillable, hours. Thus, the overall realization rate is decreased, resulting in lost profits for the firm. In addition, if audits are scheduled based on inaccurate historical information, more hours than expected may be incurred by the audit team, resulting in auditors trying to finish up work on one client, while working full time on the next assigned client. Such overlaps may result in missed deadlines, contributing to client dissatisfaction, and subsequently, to lost profits for the audit firm.

Another implication of underreporting may be increased time pressure in

following years, resulting in a continuous cycle of underreporting. Increased time

pressure may lead to the potentially more serious problem of engaging in acts of

quality reduction, including the practice of prematurely signing off on incomplete

audit procedures.[3] Premature sign-offs could preclude an audit from meeting

generally accepted auditing standards, thus creating the potential for audit failure and,

ultimately, litigation against the audit firm. Litigation, regardless of the outcome,

will not only lower firm profitability, but may cause a loss of reputation or, in

extreme cases, bankruptcy for the firm.

The accounting literature documents litigation concerns with regard to audit

failure resulting from signing off on incomplete procedures (Chow et al. 1988).

These concerns appear to be valid, given the evidence in the current accounting

literature that auditors do in fact sign off on incomplete procedures (Kelly and

Margheim, 1987, 1990; Choo, 1986; Margheim & Pany, 1986; Alderman & Dietrich,

1982; Lightner et al., 1983, 1982; Rhode, 1978).[4] This evidence underscores the

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[3]Prior accounting literature documents that auditors admit to engaging in the following five quality reduction acts: 1) accepting weak client explanations, 2) making superficial reviews of client documents, 3) failing to research an accounting principle, 4) reducing the amount of work performed on an audit step below what the auditor would consider reasonable, and 5) prematurely signing-off on an audit program step (Kelley and Margheim, 1990).

[4]The extent to which this behavior occurs is illustrated in prior accounting studies in which auditors of all ranks were questioned about their past reporting behavior. Rhode (1978) reported that 55% of the 1,526 auditors surveyed had underreported hours during their career, while 60% had signed off on a required audit step, not covered by another step, without performing it (Kelley and Margheim, 1987). Lightner et al. (1982, 1983) reported that 67% of the 972 Big Eight staff auditors they surveyed had underreported hours during the previous year. Kelley and Margheim (1987, 1990) reported that 51% of the Big Eight staff auditors questioned about a specific audit they had worked on during the previous three month period (September through November) had underreported hours, while 54% had engaged in quality reduction acts, and 9% had prematurely signed off on an audit step. A total of 64% stated they underreport hours in a typical month. Auditors in each of these studies stated that the primary reason for these behaviors was a tight time budget.

importance of creating an "ethical control environment" within accounting firms (Chow et al., 1988, p. 173-174; see McNair, 1991, p. 638). Chow et al. (1988) raise the concerns of audit quality and the financial viability of the accounting profession as reasons for expediting research in this area. They specifically call for studies that may lead to the reduction of behaviors such as "quick ticking" or similar unethical auditor behavior in the public accounting environment. In addition, the Treadway Commission (1987) recommends that public accounting firms need to recognize and control organizational pressures that potentially reduce audit quality (Kelley and Margheim, 1990). Finally, both Bamber (1993) and Chow et al. (1988) suggest that the reward systems of public accounting firms should be studied.

This study investigates the effects of time budget importance and salary structure in a controlled experimental setting. Most of the prior research documenting inaccurate reporting behavior of auditors is descriptive and is based on self-reported behaviors by audit staff (Kelly and Margheim, 1987, 1990; Choo, 1986; Margheim & Pany, 1986; Alderman & Dietrich, 1982; Lightner et al., 1983, 1982; Rhode, 1978). The variables in these survey-based studies have included limited aspects of time pressure, billing arrangements, and various personality and leadership factors in an effort to determine causes of inaccurate reporting behavior. Ponemon (1992) recently extended this research by taking a theoretical approach to explaining these behaviors in an experimental study in which subjects were required to engage in actual reporting

behavior once they had completed an audit task.[5]

Salary structure was chosen as an independent variable since different

compensation contracts may affect the utility derived from both working and reporting

overtime hours, which in turn may influence auditor tendencies toward inaccurate

reporting behavior. Several Big Six public accounting firms have made changes in

the design of their salary structures over the past few years. For example, Price

Waterhouse moved from an overtime structure to a straight salary with a subjectively

determined bonus, and then later to a straight salary with a more objective hourly-

based bonus.[6] Other firms have changed from allowing employees to be paid for all

overtime to mandating that employees take some time off in lieu of compensation pay.

For example, Arthur Andersen requires that its employees offset overtime hours by

taking a specified amount of time off on certain days during the summer months.[7] It

appears, therefore, that firms are moving toward decreasing the amount of overtime

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[5]Ponemon (1992) manipulated time pressure (budget/no budget) and peer pressure (yes/no) and incorporated the theory of moral reasoning as a determinant of the underreporting he observed in a lab study using newly hired auditors.

[6]Note that in some cases these changes were made in regional offices rather than on a nationwide basis. Thus, it is possible that the firm may have different compensation structures in different offices around the country. This information was provided verbally by the former manager in charge of recruiting for the Chicago office of Price Waterhouse.

[7]The following quote is taken from an Arthur Andersen & Co. "benefits program overview" provided to a new employee in 1992.

"Beginning June 1, all full-time managers, seniors, and staff on the payroll as of May 1 worked four eight-hour days a week for an eight week period. Unassigned seniors and staff took either Monday or Friday off. Managers and client assigned seniors and staff took off whichever day met our client needs. If client needs required a 40 hour week, seniors and staff were able to take a day off at a later time that was convenient.

During the 'winter hours' period, which is determined by each division's peak, the same practice managers, seniors, and staff will work 45 to 60 hours a week. The 5 to 20 excess hours per week will offset the accumulated summer hours taken off. Only time worked in excess of the accumulated summer hours will be considered overtime."

compensation paid out to their employees. Until now, these changes have been ignored in the accounting literature.

Time budget importance was chosen as an independent variable because the audit time budget is often used as an evaluative tool in public accounting firms (McNair 1991). Prior literature documents that consistently meeting time budgets increases the probability that auditors will be rewarded with promotion, bonuses, better client assignments and job security (Dirsmith et al., 1992; McNair, 1991; Dirsmith and Covaleski, 1985b). There is evidence that this time pressure element of the reward structure increases efficiency when time budgets are attainable (McDaniel, 1990). Alternatively, McNair (1991) speculates that when meeting the time budget is overly important regarding the promotion process and the time budget is unattainable, the effect of this evaluative aspect of time budgets on reporting behavior may lead to inaccurate, or dysfunctional, reporting behavior. The effect that the level of importance attributed to meeting an unattainable time budget may have on reporting behavior has not yet been examined in the accounting literature.

McNair (1991) suggests that ethical ambivalence theory may explain how a reward system that offers high incentives for meeting unattainable time budgets, in addition to achieving audit quality, may lead to inaccurate behavior. This study makes an attempt to measure the levels of ethical ambivalence experienced by subjects participating in an experimental audit task. There have been no known attempts to measure ethical ambivalence in the behavioral literature previous to this study.

A controlled laboratory experiment was chosen for this study in an effort to

maximize internal validity. This level of control is considered to be important since the effects of the independent variables being studied have not been examined in the accounting literature. In the experiment, 124 student subjects played a computerized "audit game." The audit game was intended to simulate the process of working through audit program procedures and required subjects to report the extent of completion of each procedure and the number of hours spent working on the task. The time budget for the audit task was unattainable and subjects had to work "overtime hours" to achieve completion of the audit procedures.[8] Time budget importance was manipulated between subjects by varying the level of influence (high/low) that meeting the time budget had on the probability of receiving a cash bonus at the end of the audit game. Salary structure was manipulated between subjects across two levels (overtime/straight salary) by varying the salary contracts assigned to the subjects. The computer created a comprehensive record of each subject's activity during the audit game. The dependent variables of reporting behavior computed and analyzed from these data were: (1) the percentage of the audit procedures left incomplete and (2) the percentage of hours worked that were unreported. Ethical ambivalence was measured based on subjects' responses to questions asked at the end of the experimental task.

The results of this experiment generally support the predictions of the model. The data show that high budget importance has a positive, significant relationship with ethical ambivalence, that a straight salary structure has a significantly more

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[8]Hours worked in the task were actually minutes, but are referred to throughout the paper as "hours."

positive relationship with ethical ambivalence than does an overtime salary structure, and that ethical ambivalence has a positive, significant relationship with underreporting hours worked and signing off on incomplete procedures. In addition, a higher amount of underreporting and signing off on incomplete procedures occurred under a straight salary structure than under an overtime salary structure.

In addition to providing information helpful to the accounting profession, this study furthers the extant literature in three areas. First, the literature related to environmental effects on reporting behavior is extended by considering the management control variables of time budget importance and salary structure. This study is also the first attempt to measure ethical ambivalence, and subsequently, test its effect on reporting behavior. Second, this study contributes to the literature on dysfunctional reporting behavior by taking a theoretical approach and providing a framework that may contribute to understanding how certain economic elements of reward systems may affect reporting behavior. Third, Hogarth (1991) suggests the development of experimental, computerized "audit games" as a means of incorporating the complexities of the audit environment into behavioral accounting studies. This study contributes to the development of this type of computerized simulation for use in future research within the audit domain.

The remainder of this dissertation is organized as follows. Chapter 2 provides a description of the audit environment, a description of the general causal model used in the study, and a theoretical explanation for the occurrence of inaccurate reporting behavior by auditors. In addition, hypotheses based on the general model are

presented in this chapter. Chapter 3 describes the experimental audit task and discusses the research method, including the operational definitions of the independent variables and the method of measuring the mediating variable. Chapter 4 reports and discusses the results of the hypotheses tests. The limitations and contributions of this study are described in Chapter 5.

CHAPTER 2

DESCRIPTION AND APPLICATION OF A GENERAL MODEL

OF THE DETERMINANTS OF REPORTING BEHAVIOR

IN THE AUDIT ENVIRONMENT

AND HYPOTHESES DEVELOPMENT

2.1   Overview of Chapter

This chapter provides an overview of the audit environment, presents a

detailed explanation of ethical ambivalence theory, and introduces a framework upon

which the general model for this study is based. Each element of the model

(reporting behavior, ethical ambivalence, salary structure and time budget importance)

is discussed in terms of the assumptions and theories that connect these elements.

2.2   The Audit Environment in Public Accounting

A primary function of staff auditors in public accounting firms is to complete

tests of details of balances for particular segments of an audit. The auditor is

provided with an audit program for the assigned segment (i.e., cash, accounts

receivable, inventory) that lists the procedures to be followed in completing the

planned tests of details. Documentation of such detail testing provides evidence

important to the formation of an audit opinion by audit firm management. In

addition, documentation that the required detail testing has been completed lends assurance that the audit meets generally accepted auditing standards.

One important aspect of the audit program is the time budget, provided to the staff auditor by audit firm management. The time budget for each audit segment is the time allocated for completion of the listed audit program procedures. Time budgets have been described as "the most common means of cost control used by public accounting firms" (AICPA, 1978). One element of cost control results from using the time budget as a basis for audit planning, which includes scheduling the audit, staff assignment, and budgeting estimated costs. For example, if the time budget for a particular audit is tight, the firm's strategy may be to assign its more efficient staff to increase the possibility of meeting the budget, thereby reducing the possibility of cost overruns. A second element of cost control results from the common practice of using the time budget for evaluating the efficiency of staff auditors, which in turn may influence promotion possibilities. Although this control mechanism encourages increased audit efficiency (McDaniel, 1990), which may ultimately reduce cost overruns, this aspect of time budgets may be problematic when the time allocations are unrealistically low. For example, McDaniel (1990) found that auditors tend to underaudit as time pressure increases.

One commonly used method of setting the time budget tends to result in unrealistically tight time constraints for staff auditors. This method involves setting the time budget after the client's audit fee has been established, as opposed to setting the audit fee based on the estimated time needed for completing the audit (McNair,

1991; Kelley and Margheim, 1987). This practice has evolved due to the increasingly competitive nature of the audit profession (AICPA, 1986; McDaniel, 1990; McNair, 1991; Dirsmith et al., 1992). Once the time budget for the entire audit has been established at the manager or partner level, it is then handed down to the senior in charge of the audit fieldwork, who allocates it among audit program segments.[1] This allocation is often based on budget reports completed by audit staff during the client's prior year audit (Lightner et al., 1982, 1983). If these prior year reports are inaccurate, this allocation method may also result in unrealistic time constraints on the staff auditor, which in turn may lead to inaccurate reporting behavior.

2.3 Ethical Ambivalence Theory

One could argue, given the ethical standards advocated by the accounting profession and the assumption that individuals have negative utility for dishonesty, that the integrity of the individual working in the accounting profession should prevail over any environmental factors that would cause an individual to be dishonest. However, the organization behavior literature provides one explanation as to why even individuals of integrity may feel justified in engaging in certain dishonest behaviors. Jansen and von Glinow (1985) suggest that when the reward structure of

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[1]This description of the budgeting process is based on discussions with several former auditors of Big Six accounting firms. One former manager of Deloitte & Touche, with ten years of experience, specifically stated that the senior was responsible for creating the first draft of the budget, but that management always slashed whatever the senior proposed. He stated that essentially the senior didn't have much control over the budget and that for the most part the budget is forced on the staff by management. The experiences of the other former auditors were very similar to this scenario.

an organization is one that provides incentives to attain high levels of achievement for conflicting goals, such as completing a high quality audit within tight time constraints, the resulting individual behaviors may be judged to be inappropriate. These behaviors are likely to occur when an organizational reward system sends conflicting signals, which result in ambivalence with regard to the organization's expectations of the individual (Jansen and von Glinow, 1985). For example, consider the staff auditor who is given an unrealistically tight time budget. The auditor expects to be rewarded for achieving audit quality and for meeting the time budget, and also knows it is against the firm's formal policy to underreport hours or leave assigned procedures incomplete. However, if the auditor follows firm policy, the probability of being evaluated positively, and subsequently rewarded, decreases, since it is not possible to achieve both audit quality and budget. Alternatively, if the auditor breaks with policy and underreports or signs off on incomplete procedures, *appearing* to meet budget, the probability of being rewarded increases. Thus, the firm appears to be rewarding the auditor for breaking the rules, indicating that its *formal stated reporting policy* may differ from its "unwritten and unspoken" *informal operative reporting policy*. Consequently, the auditor in this situation is likely to believe that the informal policy is the policy actually followed by the firm in rewarding its employees. McNair (1991) argues that such conflicting signals create ambivalence for the auditor faced with the decisions described above. She suggests that ethical ambivalence theory provides an explanation for continued dishonest reporting behavior by auditors.

Ethical ambivalence is a form of sociological ambivalence. Webster's

dictionary defines ambivalence as "simultaneous conflicting feelings toward a person

or thing" (1953, p. 46). The theory explains that sociological ambivalence occurs

when an individual appears to be pulled in psychologically opposite directions

(Merton & Barber, 1963; Merton, 1963, 1976). Such a situation exists whenever an

individual is faced with

> incompatible normative expectations or attitudes, beliefs and behaviors
> assigned to a role or set of roles in a social system....ambivalence occurs
> whenever conflicting signals about desired behavior are generated by the
> organization's management control system (McNair, p. 644).

Jansen and von Glinow (1985) explain that the behaviors of employees will

follow both the norms and counternorms found in an organizational environment.

While norms are common beliefs about appropriate and required behavior for group

members as group members (Katz & Kahn, 1978), counternorms are viewed as

inappropriate, and yet, under certain circumstances, as necessary (Merton and Barber,

1963). For example, the norm would be to follow the rules, or written policy, while

the alternative counternorm would be to break the rules to get the job done. Jansen

and von Glinow (1985, p. 815) state that

> If the reward system inadvertently supports these counternorms, a special type
> of sociological ambivalence...ethical ambivalence, is likely to result...Ethical
> ambivalence is a form of sociological ambivalence in which (a) the behaviors,
> attitudes, and norms that are shaped and maintained by the organizational
> reward system conflict with (b) the behaviors, attitudes and norms congruent
> with the ethical values and judgments of organizational stakeholders.

2.4   Reporting Behavior

Reporting behavior, as it applies to this study, is defined as signing off on assigned procedures and reporting the number of hours worked on a task. The ultimate reporting behavior of the auditor facing an unattainable time budget is the result of the two sequential decisions depicted in Figure 2.1. This decision model is adapted from McNair's (1991, p. 641) "Time Budget Phenomenon" model. The model lays out the step by step progression of the auditor's reporting decision process, beginning with the processing of an assigned audit procedure and ending with the auditor's reporting behavior.

The decision model illustrates that the auditor must first decide whether to complete an audit procedure or to leave the procedure unfinished. In either case, the auditor will report the procedure as complete, based on the assumption that reporting an audit procedure as incomplete would only result in the auditor being told by a superior to complete it. This decision determines whether the auditor will follow path A or path B in the model, and reduces the reporting behavior options from four to two. For example, the auditor who decides to complete the procedure will follow path A and report completion honestly, yet exceed the time budget, while the auditor who decides to leave the procedure incomplete will follow path B and report completion dishonestly by signing off on an incomplete procedure. Signing off on incomplete procedures in the audit environment generally consists of stating in the audit workpapers that an audit procedure, usually listed on an audit program, has
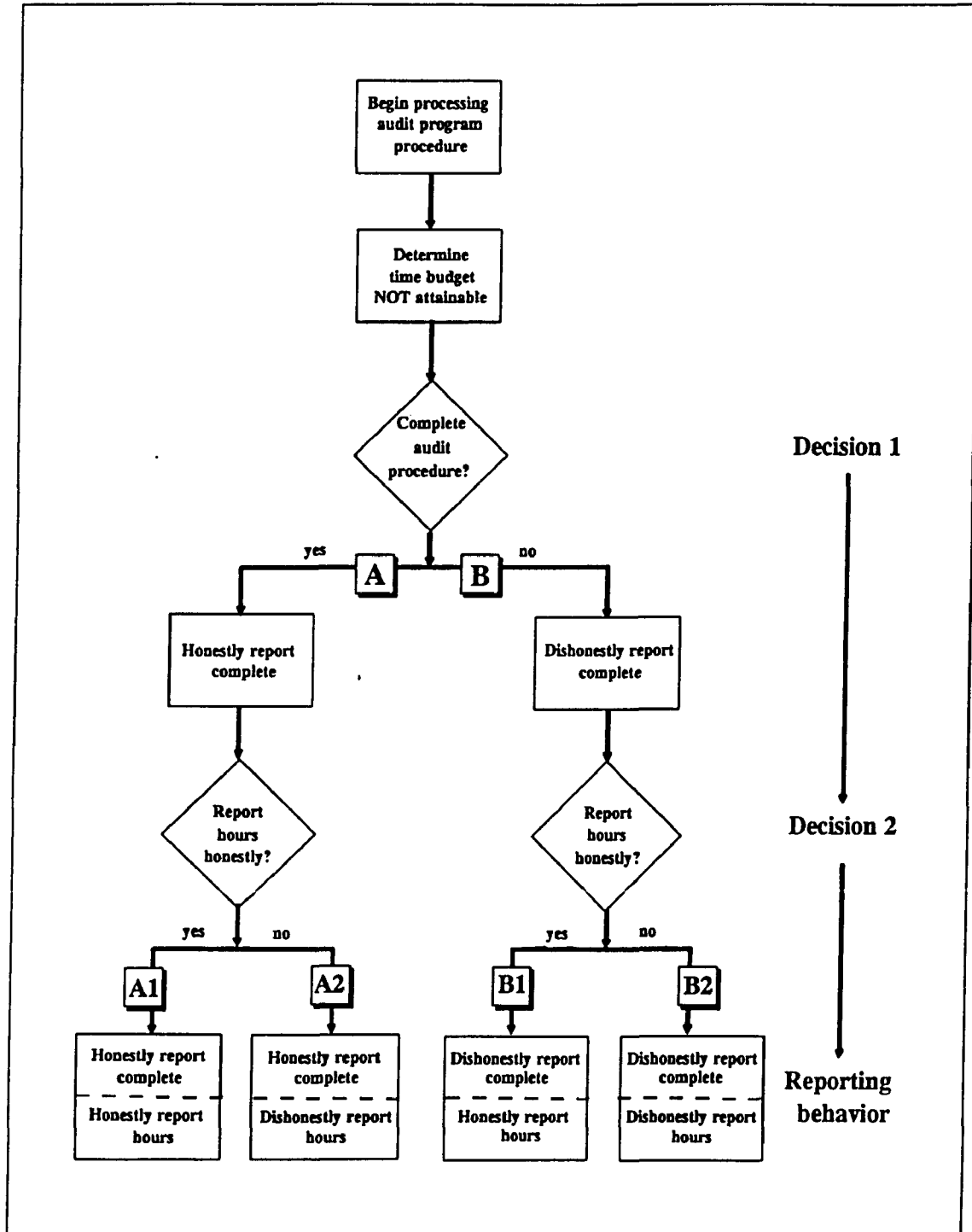
Figure 2.1
Auditor Reporting Decision Model
(Adapted from McNair's "Time Budget Phenomenon Model")

been completed during the course of the audit, when in fact, it has not.

Second, the auditor must decide whether to report honestly, or dishonestly, the hours spent on the task. Auditors who decide to report time honestly will engage in reporting behavior A1 or B1, while those who report dishonestly will engage in either A2 or B2. Auditors who decide to report dishonestly may either underreport or overreport hours spent working on the assigned procedure. Underreporting hours consists of recording, in the audit workpapers, a lesser number of hours than was actually spent on a particular audit task. This study does not address overreporting.[2]

Ultimately, the two decisions will result in one of the four reporting behaviors depicted in the model. Each of the two decisions will be a function of utility. Expected utility theory, which assumes that individuals act to maximize wealth, or satisfaction, predicts that individuals will follow the decision path that leads to the most desirable outcome.[3] The prediction concerning which decision path an individual will follow is based on two basic assumptions: (1) individuals have positive utility for increasing both salary and the probability of rewards and (2) individuals have negative utility for dishonesty. Thus, reporting behavior is a function of the salary structure under which the auditor is working, the probability of being evaluated positively as a result of engaging in a particular behavior, and the disutility of

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[2]The experiment was designed such that subjects were unable to report more hours than they actually spent working on the audit procedures.

[3]Satisfaction is the basis of Bernoullian utility. One precisely defined form of Bernoullian utility measures the strength or intensity of a person's preferences for certain outcomes (Dyer and Sarin, 1982; see Yates, 1990). Thus, the most preferred outcome is expected to maximize utility for the subject, in terms of both economic and psychological wealth.

dishonesty, which includes any repercussions resulting from detection. This idea can be expressed by the following equation:

Reporting Behavior $= f$ [(+) Increasing Salary,

(+) Increasing Probability of Non-salary Rewards, (-) Increasing Dishonesty]

When the time budget is unattainable, the utility derived from each element in this equation is expected to be affected by one or more of the variables of salary structure, time budget importance, and ethical ambivalence depicted in the general causal model in Figure 2.2.[4]

2.5   The General Causal Model

In the causal model depicted in Figure 2.2, both ethical ambivalence theory and expected utility theory provide the bases for predicting the relationships illustrated. In terms of the reporting behavior equation presented in section 2.4, ethical ambivalence theory predicts that the disutility for dishonesty will diminish under increased time budget importance. This prediction is based on the notion that feelings of ethical ambivalence will result from conflicting signals regarding the firm's expectations of the individual working under an unattainable time budget. As a result of this conflict, an individual is more likely to follow paths A2, B, or B2 in Figure

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[4]The model in Figure 2.2 is simplistic in assuming that the level of knowledge or experience and the level of effort intensity of subjects is constant across subjects. This simplification is made possible by a task design which precludes skill and effort intensity from affecting individual subjects' performances with regard to successfully completing the task within the time budget.
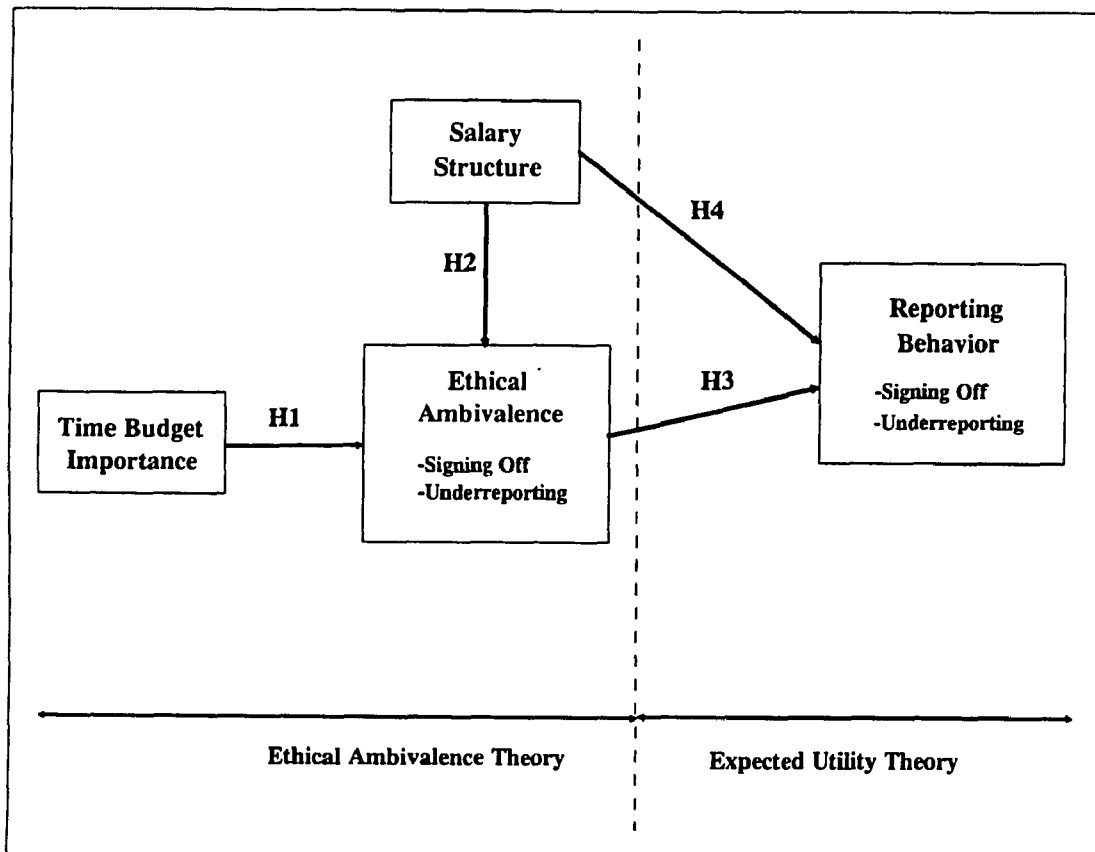
Figure 2.2
Causal Model of the Effect of Reward Structure on Reporting Behavior

2.1 than when such conflict does not exist. This prediction is based on the idea that

engaging in dishonest behavior provides an individual with the opportunity for

increasing the probability of receiving rewards other than salary, whereas honest

behavior does not. Consequently, time budget importance, salary structure, and

subsequently, ethical ambivalence are expected to affect the decision process leading

to reporting behavior. Hypotheses for each of these relationships are developed and

discussed in the following section.

2.6   Development of Hypotheses

2.6.1   Effect of Time Budget Importance on Ethical Ambivalence

The non-salary rewards available to auditors generally consist of promotions,

better client assignments, bonuses, and job security. The non-salary reward available

to the subjects in the experimental audit task for this study consisted of a cash bonus

that, if "earned," was collected by subjects one week after the experiment. The

positive utility derived from this reward element, shown in the equation in section

2.4, is expected to be a determinant of an individual's reporting behavior when the

time budget is unattainable.

The experimental audit task was designed to allow all subjects to complete all

audit procedures assigned. However, it was not possible for any subject to both

complete the procedures and meet the time budget. Yet the probability of being

rewarded with a non-salary reward was maximized when the time budget was met, or

appeared to have been met. This aspect of the reward structure was intended to

create the perception that management's *formal stated reporting policy*, which forbade

dishonest reporting behavior, was in conflict with its *informal operative reporting*

policy, which appeared to support such behavior by rewarding it.

The two levels of time budget importance were manipulated by varying the

probability of receiving a cash bonus, given the number of hours reported in excess of

the time budget. As long as the time budget was met, the probability of receiving the

bonus was equal across the high/low time budget importance conditions. However, as

the number of reported hours in excess of the time budget increased, the probability

of receiving a bonus decreased more rapidly in the high time budget importance

condition than in the low time budget importance condition. Consequently, subjects

in the high time budget importance condition were expected to perceive more conflict

in the signals coming from management's *formal stated reporting policy* and its

reward system. The perceived conflict was expected to be much lower for subjects

working in the low importance condition, since the probability of being rewarded

depended less on achieving the time budget, and more on achieving audit quality.[5]

Ethical ambivalence theory suggests that such conflict results in feelings of ethical

ambivalence. Hypothesis 1 predicts the effect of time budget importance on the level

of ethical ambivalence experienced by subjects.

> H1: *Ceteris paribus*, subjects working under high time budget importance
> will experience more *ethical ambivalence* than subjects working under
> low time budget importance.

2.6.2 Effect of Salary Structure on Ethical Ambivalence

Salary structures within public accounting firms range from straight salary

structures with year-end bonus potential to overtime structures that pay either straight

time, time and one half, and/or offer compensation time off in lieu of overtime pay.

In the experimental audit task used for this study, the salary paid to subjects was

based on either an overtime or a straight salary contract. The overtime salary

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[5]Audit quality in the proposed experiment is synonymous with reporting all of the tests of details procedures as complete.

structure consisted of a base salary plus the opportunity to earn overtime pay for each overtime hour worked and reported. The straight salary structure provided subjects with a fixed salary for participating in the experimental task, regardless of the hours worked and reported.

As long as subjects reported the time budget had been met, the salary earned was equal across salary conditions. However, when hours in excess of the budget were worked and reported, subjects in the overtime salary condition were paid for those hours, while subjects in the straight salary condition were not. Consequently, subjects in the overtime salary condition were expected to perceive little or no conflict in the signals coming from management's *formal stated reporting policy*, which forbade underreporting and signing off early, and the salary element of its reward system, which rewarded hours worked and reported in excess of the time budget. The perceived conflict was expected to be much higher for subjects working in the straight salary condition, since the subject received no economic benefit for working and reporting hours in excess of the time budget. Hypothesis 2 predicts the effect of salary structure on the level of ethical ambivalence experienced by subjects.

> H2: *Ceteris paribus*, subjects working under a straight salary structure will experience more *ethical ambivalence* than subjects working under an overtime salary structure.

2.6.3 Effect of Ethical Ambivalence on Reporting Behavior

Prior literature documents that consistently meeting audit time budgets increases the probability that auditors will be rewarded with promotion, bonuses,

better client assignments, and job security (Dirsmith et al., 1992; McNair, 1991; Dirsmith and Covaleski, 1985b). This practice becomes problematic when time budgets are unattainable and the reward structure of the accounting firm is designed such that meeting time budgets is critical to the staff auditor receiving the above mentioned rewards. Ethical ambivalence theory suggests that if organizational reward systems exert pressure on individuals to behave dishonestly, such behavior is not only a function of the person, but also of the environment. The compromising behaviors of underreporting hours and signing off on incomplete audit program procedures would be considered counternorms under sociological or ethical ambivalence theory. Dirsmith & Covaleski (1985, p. 155) provide evidence that the counternorm of underreporting hours is "informally" supported by the reward systems in public accounting firms.

> While the formal policy for every office from which people were contacted was that 'eating time' was strictly forbidden, the informal system noted that it is one way of demonstrating a commitment to the firm and also the client.

Expected utility theory provides the basis for hypothesizing the effects of ethical ambivalence on the reporting decisions depicted in Figure 2.1. Simply, the negative utility normally derived from dishonesty was expected to decrease for subjects who experienced a high level of ethical ambivalence. These subjects were expected to perceive that management actually expects them to engage in dishonest behavior and, consequently, were expected to be more likely to choose path B in the decision model than were subjects who experienced a lower level of ethical

ambivalence. Similarly, subjects who experienced a higher level of ethical

ambivalence were expected to be more likely to choose paths A2 or B2 than subjects

who experienced a lower level. Hypotheses 3A and 3B predict the effect of ethical

ambivalence, and the resulting decrease in disutility for dishonesty, on reporting

behavior.

H3A: *Ceteris paribus*, subjects who experience higher levels of ethical
       ambivalence will be more likely to *sign off on incomplete procedures*
       than subjects who experience lower levels of ethical ambivalence.

H3B: *Ceteris paribus*, subjects who experience higher levels of ethical
       ambivalence will be more likely to *underreport* hours than subjects who
       experience lower levels of ethical ambivalence.

2.6.4 Effect of Salary Structure on Reporting Behavior

Expected utility theory suggests that auditors working under an overtime salary

structure will be more inclined to complete audit tasks and also report total hours

worked accurately than will auditors working under a straight salary structure, since

an overtime salary structure will provide extra salary or time off for working and

reporting time worked in excess of budget. Thus, under an unattainable time budget,

the positive utility derived from the salary element in the equation in Section 2.4 is

expected to be higher under an overtime salary structure than under a straight salary

structure.

This expectation provides the basis for hypothesizing the effects of salary

structure on each of the two decisions depicted in Figure 2.1, when completing the

audit task requires overtime hours. Simply, subjects working under an overtime

salary structure who decided to complete the task were paid for any overtime hours

incurred, while subjects working under a straight salary structure were not.

Therefore, subjects working under an overtime structure were expected to derive

more utility from completing the task than subjects working under the straight salary

structure and, consequently, were expected to be more likely to choose path A in the

decision model.[6] Hypothesis 4A predicts the effect of this increased utility on

reporting behavior.

> H4A: *Ceteris paribus*, subjects working under an overtime salary structure
> will be less likely to *sign off on incomplete procedures* than subjects
> working under a straight salary structure.

Similarly, subjects working under an overtime salary structure earned overtime

pay for all overtime hours reported, while subjects working under a straight salary

structure could derive no incremental economic benefit from reporting overtime

hours. Consequently, the utility of following either path A1 or B1 was expected to be

higher for subjects working under an overtime salary structure than for subjects

working under a straight salary structure. Hypothesis 4B predicts the effect of this

increased utility on reporting behavior.

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[6]Informal conversations held with managers of Big Six accounting firms provide anecdotal evidence that compensation structure does actually influence total hours worked and, subsequently, reported. For example, one manager stated that when his firm changed from a straight salary structure to one of overtime, reported hours on specific jobs increased noticeably over those reported the previous year. Another stated that once his firm switched to a straight salary structure, the average amount of overtime worked decreased noticeably.

H4B: *Ceteris paribus*, subjects working under an overtime salary structure will be less likely to *underreport* hours than subjects working under a straight salary structure.

2.7   Chapter Summary

This chapter laid out a utility based decision model depicting the decision process of the auditor working under an unattainable time budget and described a general causal model of the determinants of reporting behavior. The causal model first draws on ethical ambivalence theory (Jansen and von Glinow, 1985; McNair, 1991) to explain the underlying psychological construct that may be contributing to innacurate reporting behavior by auditors, as reported in prior accounting studies (Kelly and Margheim, 1987, 1990; Choo, 1986; Margheim & Pany, 1986; Alderman & Dietrich, 1982; Lightner et al., 1983, 1982; Rhode, 1978) and second, on expected utility theory to explain the cost/benefit analyses that auditors may enter into in their reporting decision process. The decision and causal models together provide the basis for generating hypotheses regarding the effects of salary structure, time budget importance, and ethical ambivalence on reporting behavior in a situation where the time budget is unattainable. The following chapter describes the experimental audit task, the operationalization of the independent variables, the measurement of the mediating ethical ambivalence variable, and the research method used to test the hypotheses.

CHAPTER 3

RESEARCH METHODOLOGY

3.1   Overview of Chapter

This chapter describes the research methods used to empirically test the hypotheses developed in Chapter 2. The research design includes manipulations of the two independent variables of time budget importance and salary structure and the measurement of the mediating variable of ethical ambivalence.

The remainder of this chapter is organized as follows. Section 3.2 describes a tests of details audit task as it exists in the real world auditing environment. Section 3.3 describes the experimental audit task while section 3.4 explains how that task reflects essential features of the public accounting environment with regard to reporting the completion of audit procedures and reporting the time spent working on those procedures. The administration of the experiment and subject selection is discussed in sections 3.5 and 3.6 respectively. Section 3.7 explains the operational definitions of the independent variables. It also discusses the use of preliminary confirmatory factor analysis to determine the appropriate observed variables (post-experimental statements) for measuring the latent variable of ethical ambivalence in the final path model. This section includes descriptive statistics for the factors derived from the preliminary factor analysis. Section 3.8 discusses the correlation analyses for all variables. The correlation matrices presented in this section present

the data used in the path analysis discussed in Chapter 4. Section 3.9 provides the chapter summary.

3.2 The Tests of Details Audit Task

Staff auditors in public accounting firms spend much of their time completing tests of details of balances found in a client's trial balance. The required steps for testing such details are generally listed as audit procedures on an audit program provided to the staff auditor by management. The auditor is responsible for performing the procedures listed, and subsequently, for providing a signed statement describing any unusual findings and stating that the work has been completed as assigned. A few examples of tests of details procedures include the examination of invoices or cancelled checks to determine that transactions have been recorded in the proper period, or performing test counts of inventory or observing fixed assets to determine existence. In conjunction with the audit program, the auditor is provided with a time budget for each balance sheet segment (cash, accounts receivable, inventory, etc.) to be tested. Throughout the audit job, the auditor is required to record the time spent completing the audit procedures on a weekly time sheet, and many times, directly in the audit workpapers. Thus the reporting behaviors of providing a signed statement that the work has been completed, or signing off, and recording the time worked are integral parts of the audit task as a whole.

3.3   The Experimental Audit Task

The experimental task included a computerized audit game that provided

subjects with a simulation of a basic test of details of accounts receivable. The game

required subjects to work through five audit programs, one each for Division One

through Division Five of a hypothetical company called Computer Technologies, Inc.

(CTI), with each program listing two audit procedures to complete.[1] Each of the five

sessions was independent of the other four, with the fifth session determining the

compensation earned in the experiment.[2] The description of the audit game that

follows incorporates the items that appeared on the computer screen for Division Five

of CTI. A more detailed description of the audit game is included in Appendix A,

which provides a detailed explanation of the entire experiment.

The audit game module began with the following message appearing on the

---

[1]Three different audit procedures were included in the audit programs used in the audit game. An example of the evidence viewed for the "Accounts Receivable Aging Schedule" procedure (Procedure A on the Division Four Audit Program) is depicted in Table A.11. An example of the evidence viewed for the "Sales Cut-Off" procedure (Procedure B on the Division Four Audit Program and Procedure A on the Division Five Audit Program) is depicted in Table A.13. An example of the evidence viewed for the "Confirmation" procedure (Procedure B on the Division Five audit program) is depicted in Table A.15. The program for each of the five divisions listed two of these three possible procedures. Since each procedure required the same basic actions on the part of the subjects, the issue addressed by each procedure was not expected to affect the likelihood that subjects might be more inclined to complete one procedure as opposed to another. Another reason for this expectation is the use of student subjects, since students would have little or no basis for determining that one audit procedure may be more important than another.

The audit program procedures used in the proposed experiment are adapted from an audit program for accounts receivable in Arens and Loebbecke (1991).

[2]The results of the study are reported for only the fifth session (Division Five) of the audit game. Subjects were informed from the beginning of the experimental task that the first four sessions were intended to be practice sessions and that their compensation would be based on their performance in the fifth session. Therefore, it would not be meaningful to report the results from the first four sessions of the audit game.

subject's computer screen. When 'P' was pressed, the audit program in Table 3.1

appeared on the screen.

> Welcome to the Division Five Audit Team.
>
> Press 'P' to receive your audit program
> for Division Five of CTI.

Table 3.1
Audit Program for Division Five

Audit Program for CTI, Division Five

Tests of Details of Balances Audit Procedures		Sample Size	Items to Select	Time Budget
A.	Select the last 12 sales transactions from current year's sales journal and trace each to the related shipping documents to determine each is recorded in the proper period. Determine that each customer has proper credit approval.	12	8 largest 4 random	4 hours
B.	Obtain direct confirmation of accounts receivable and perform alternative procedures for nonresponses.	36	30 largest 6 random	6 hours

> Press 'A' to process Procedure A.
> Press 'B' to process Procedure B.
> Press 'S' to receive a Status Report.

When the subjects pressed 'A' or 'B' to process one of the procedures listed

on the audit program, the following message appeared on their computer screen.

> Procedure A (or B) is now being processed.
>
> Press 'X' to receive your first and each
> additional piece of evidence.

Table 3.2 illustrates a piece of evidence that would have appeared on the computer screen during the processing of Procedure A in the audit program for Division Five (see Table 3.1). Table 3.3 shows the piece of evidence that would have followed the evidence in Table 3.2 once the subject pressed 'X' to receive it. Note that the only difference in the evidence in Tables 3.2 and 3.3 is the additional "Yes" inserted on the third line in the "Proper Cut-off?" column. This additional "Yes" simply means that another item on the schedule has been successfully tested. Each subsequent piece of evidence would have shown an additional "Yes" in one of the two columns until testing for all customers listed had been completed by the computer. It was necessary for the subject to press 'X' to view each piece of evidence available in order to complete the procedure as described on the audit program. This was a time-consuming task since the computer game had been programmed to take a certain amount of time between making each additional piece of evidence available to the subject. On the other hand, it was an easy task since the subject was required simply to view the evidence, as opposed to actually performing the audit work.

Table 3.4 illustrates an accounts receivable confirmation which appeared as a piece of evidence during the processing of Procedure B, listed in the audit program (see Table 3.1). If the subjects completed Procedure B for Division Five, they viewed 36 different confirmations on their screens.

Table 3.2
Evidence from Procedure A listed on Audit Program for Division Five

Computer Technologies, Inc. (Division Five)
Testing of Cutoff and Credit Approval Procedures
For Year Ending August 31, 1993
(Worksheet prepared by client)

Customer	Invoice Number	Amount	Proper Proper Cut-off?	Credit Approval?
Black Mfg. Co.	6332	$ 6,500	Yes	Yes
Cannon Insurance Co.	6316	960	Yes	Yes
Ellis and Adamson	6357	45		
Farmer & Sons	6352	1,400		
Gray Steel Inc.	6333	8,753		
Jackson Travel	6334	943		
KAFCO	6346	5,750		
Trout Mfg. Co.	6342	1,627		
Vance Food Products	6339	12,477		
Young Industries	6356	9,120		

X - to receive next piece of evidence.
T - to check Time Budget status.
Q - to Quit processing the procedure.

Table 3.3
More Evidence from Procedure A listed on Audit Program for Division Five

Computer Technologies, Inc. (Division Five)
Testing of Cutoff and Credit Approval Procedures
For Year Ending August 31, 1993
(Worksheet prepared by client)

Customer	Invoice Number	Amount	Proper Proper Cut-off?	Credit Approval?
Black Mfg. Co.	6332	$ 6,500	Yes	Yes
Cannon Insurance Co.	6316	960	Yes	Yes
Ellis and Adamson	6357	45	Yes	
Farmer & Sons	6352	1,400		
Gray Steel Inc.	6333	8,753		
Jackson Travel	6334	943		
KAFCO	6346	5,750		
Trout Mfg. Co.	6342	1,627		
Vance Food Products	6339	12,477		
Young Industries	6356	9,120		

X - to receive next piece of evidence.
T - to check Time Budget status.
Q - to Quit processing the procedure.

Table 3.4
Evidence from Procedure B listed on Audit Program for Division Five

COMPUTER TECHNOLOGIES, INC.

September 1, 1993

AAA Employment
678 N. Park
Oolitic, IN

Sir/Madam:
    In connection with an examination of our financial
statements, please confirm directly to our auditors

Dewey Countemup & Howe, CPA's
Bloomington, IN

the correctness of the balance of your account with us as of
8/31/93, as shown below. This is NOT a request for payment;
please do not send your remittance to our auditors. Your prompt
attention to this request will be appreciated. An envelope is
enclosed for your reply.

Charles Q. Arbuckle, Chief Accountant

x   The balance receivable of $3,785 as of 8/31/93 is correct.

The balance is NOT correct.

Date 9/10/93 By Rodney P. Cork

X - to receive next piece of evidence.
T - to check Time Budget status.
Q - to Quit processing the procedure.

The choices listed at the bottom of each piece of evidence provided the

subjects with the options of continuing to process the remaining evidence, comparing

their progress in completing the audit procedure to the time remaining in the time

budget for the procedure, and telling the computer to quit processing the procedure.

If the subject chose 'X' the next piece of evidence appeared on the computer screen,

always listing the same three choices at the bottom of the screen. If the subject chose

'T' the "Time Check" message illustrated below appeared in the upper right hand

corner of the computer screen for a total of eight seconds, before disappearing.

```
┌─────────────────────────────────┐
│          Time Check             │
│  Time Budget Allotted     X.XX  │
│  Time Budget Used Up      X.XX  │
│  % of Time Budget Used    _%    │
│  % of Procedure Processed _%    │
└─────────────────────────────────┘
```

Subjects could press 'T' as often as they wanted to during the experiment. If the

subject chose 'Q' the computer stopped processing the procedure, the time clock

keeping track of the time budget and time used stopped, and the following message

appeared on the computer screen. If the subjects then chose 'P' the computer

```
┌──────────────────────────────────────────┐
│  Processing of Procedure A (or B) has stopped. │
│       The Time Clock has stopped.          │
│                                            │
│     T - to check Time Budget status.       │
│       S - to receive Status Report.        │
│       P - to return to Audit Program.      │
└──────────────────────────────────────────┘
```

returned to the audit program for the division on which they were currently working.

Thus subjects could then choose to continue processing one of the two procedures

listed or go to the status report. These options are illustrated in Table 3.1. If the

subjects chose 'S' to receive a status report, the report illustrated in Table 3.5

appeared on their computer screen. The Status Report provided them with a progress

report and a time check regarding both procedures listed for the division on which

they were currently working. In addition, subjects signed off on the audit procedures

and recorded their hours worked on the Status Report. This information was then

processed by the computer and used to produce the appropriate Performance

Evaluation for the subjects. There was a separate Status Report and Performance

Evaluation for each of the five divisions.

Table 3.5
Status Report for Division Five

```
┌──────────────────────────────────────────────────────────────────────────────┐
│                                 Status Report                                   │
│                                 Division Five                                   │
│                                                                                 │
│  Procedure A:                               Procedure B:                        │
│  Time budget:          X.XX hours           Time budget:          X.XX hours    │
│  Actual time spent:    X.XX hours           Actual time spent:    X.XX hours    │
│  % of time budget used:  XXX%               % of time budget used:  XXX%        │
│  % of procedure completed: XXX%             % of procedure completed: XXX%      │
│                                                                                 │
│                                                                                 │
│  _____  I have performed Procedure A as described in the Audit Program for Division Five. (Y/N)  │
│                                                                                 │
│               I spent __.__ "hours" working on Procedure A.                     │
│                                                                                 │
│                                                                                 │
│  _____  I have performed Procedure B as described in the Audit Program for Division Five. (Y/N)  │
│                                                                                 │
│               I spent __.__ "hours" working on Procedure B.                     │
└──────────────────────────────────────────────────────────────────────────────┘
              ┌────────────────────────────────────────┐
              │  E - receive Performance Evaluation.    │
              │  P - return to Audit Program.           │
              │  C - Change Answers.                    │
              └────────────────────────────────────────┘
```

When subjects who had not completed Procedure A (or B) answered "No" to

the statement on the Status Report (see Table 3.5), the following message appeared on

their computer screen.

```
┌─────────────────────────────────────────────────────────────────────┐
│  NOTE:  You have indicated that you left Procedure A (or B) unfinished. │
│     Press 'Y' to indicate that Procedure A (or B) has been completed.  │
│       Press 'A' (or 'B') to continue processing Procedure A (or B).    │
└─────────────────────────────────────────────────────────────────────┘
```

If subjects attempted to record more hours than they had actually worked on a particular procedure, the following message appeared on their computer screen. (Assume that they had spent six hours to complete a particular procedure.) This

```
You are limited to reporting 6 hours of work.
Press 'Enter' to continue.
```

control kept subjects from overreporting the hours they had worked. The computer accepted any number of hours reported as long as it was less than or equal to the actual time spent working on the procedure. Thus subjects were allowed to underreport their time.

If subjects answered "Yes" to the completion statement in Table 3.5 when in fact they had not actually completed the procedure, the computer accepted their answer. Thus subjects were allowed to sign off on incomplete procedures. Also, subjects were allowed to change their answers on the Status Report for a particular division up until they moved on to the next division. Thus subjects were able to determine how different answers recorded on the Status Report affected their Performance Evaluation and their chances of winning the lottery drawing that was to take place the following week.

Subjects first received their Performance Evaluation on the computer screen. The options listed at the bottom of the Evaluation allowed them to print out their evaluation if they were happy with it, or to return to the Status Report either to make

changes to their reports or to continue processing the appropriate audit procedures.[3]

Once subjects printed out their Performance Evaluation they were not able to go back

and make any changes in the particular division on which they had finished working.

In summary, each session, or Division, of the audit game provided subjects

with an audit program; required that they perform two audit procedures, which

consisted of simply viewing audit evidence on the computer screen; required that they

sign off on the audit procedures and report the time spent working; and provided

them with a performance evaluation once they had reportedly finished the task for

each Division.

3.4   Realism of the Audit Task

While the experimental task was designed to be as realistic as possible given

the laboratory setting, the task also incorporated tight controls in an effort to

maximize the internal validity of the manipulated conditions. This level of control

was accomplished by holding constant possible confounding variables such as

knowledge, audit experience, and effort. As a result, the task was simplistic because

subjects were not actually required to perform the audit work necessary to complete

the detail testing; they simply had to observe each piece of evidence made available to

them on the computer screen in order to complete their assigned audit procedures.   In

---

[3]Copies of two actual performance evaluations received by subjects during the audit game are
illustrated in Tables A.18 and A.19 in Appendix A.

addition, they had no control over the speed at which the audit evidence could be observed, or the procedures completed.

In an effort to maximize realism, four features of the audit environment considered integral to the study of reporting behavior were incorporated into the experimental task. They include the indoctrination of staff auditors into the culture of public accounting firms as it relates to reporting behavior; the ability of auditors to continue working on audit procedures despite exceeding the time budget; the act of reporting the completion of, and time spent working on, audit procedures; and the learning process an auditor goes through as a result of receiving performance evaluations that support, or fail to support, the auditor's chosen reporting behavior.

First, the indoctrination of staff auditors into the culture of public accounting firms was considered important given the evidence that auditors learn quickly from their peers, and sometimes from their seniors (McNair, 1991), that reporting behaviors inconsistent with written firm policy may be occurring throughout the firm (Kelly and Margheim, 1987, 1990; Choo, 1986; Margheim & Pany, 1986; Alderman & Dietrich, 1982; Lightner et al., 1983, 1982; Rhode, 1978). To accomplish this indoctrination, subjects were provided with the document presented in Table 3.6. The document described several aspects of reporting policies and reporting behavior of auditors in public accounting firms.

The purpose of this document was to inform subjects about reporting policies, various reporting behaviors that have actually occurred in the "real world," and the ramifications of such reporting behaviors for the firms. Providing this information

was considered important since the subjects who participated in the experiment were

students who had limited or no experience in the public accounting environment.

Table 3.6
Information on Reporting Policy

Information on Reporting Policy

Public accounting firms, including the one for which you are working, have formal policies against underreporting the number of hours spent working on an audit and also against signing off on an audit procedure that has not been completed (i.e., saying it has been completed, when it has not). However, numerous auditors in the real world have self-reported that they have engaged in both of these reporting behaviors sometime during their career, due to tight time budget constraints. Since both of these reporting behaviors are virtually unobservable, it is very hard for the person who is reviewing the audit workpapers (i.e., the Audit Manager) to determine that an auditor (an Audit Senior or Audit Staff) has engaged in these behaviors. Consequently, both of these reporting behaviors by auditors often go undetected.

Both of these inaccurate reporting behaviors can affect the profitability of the accounting firm. Underreporting has the potential to decrease the number of hours that can be billed to the client, while signing off on an incomplete audit procedure has the potential to result in incomplete, or inaccurate, audit evidence. Such inaccurate evidence could result in audit failure or even litigation against the accounting firm.

Second, auditors working in public accounting firms cannot realistically stop

working on audit procedures just because the time budget has been used up. Prior

accounting studies that incorporate time budget pressure or unattainable time budgets

have not allowed subjects to finish their assigned task once the time budget has been

used up (McDaniel, 1990).[4] This study allowed subjects to continue working and also incorporated uncertainty regarding the amount of time it would take to finish the audit procedure.

Third, subjects working in the experimental audit task were required to sign off on audit procedures on which they had worked and also, to report the number of "hours" they had worked on those procedures. As discussed above, this reporting requirement is an integral part of the audit task. Consequently, it is possible that this requirement influences the quality and quantity of work performed.

Finally, to accomplish the learning process with regard to performance evaluations, the audit game was designed to include five sequential sessions of the audit task, which enabled subjects to learn how their reporting behavior affected their potential overall compensation for each session. The first four sessions, which involved auditing Divisions One through Four of the company, were described to subjects as practice sessions while the fifth session (Division Five) determined the subjects' actual compensation. Subjects received a printed performance evaluation following each session, based on their reported performance for that particular session. This element of the audit game was intended to proxy for the process of learning how certain reporting behaviors affect the potential for rewards, that staff auditors go through during the first several months of employment.

---

[4]Ponemon (1992) allowed subjects to continue working past an "ideal time standard" that had been communicated to the subjects at the beginning of the task. However, this "standard" was not operationalized as an actual time budget, does not appear to have been mentioned again once the subjects had started the task, and there was no penalty to the subject for failing to finish within the standard. This "standard" (or budget) vs. "no standard" was an independent variable in his study.

3.5   Administration of the Experiment

The experiment was conducted over an 8 day period and included 18 experimental sessions, with up to 8 student subjects participating in each session. The sessions took place in an academic behavioral laboratory containing 8 computer stations that were networked to a single printer. The computer stations were arranged so that subjects could not easily see the computer screens of the subjects sitting next to them. Upon arrival, subjects were allowed to sit at any of the 8 computer stations available in the room. Each session of the experiment was administered by the same experimenter in an effort to maintain consistency across sessions. Table 3.7 provides a summary of the sequence and description of the experimental task modules.

Table 3.7
Sequence and Description of Experimental Task Modules

1. Provide subjects with general instructions.
2. Provide "Information on Reporting Policy" in Public Accounting Firms.
3. Subjects answer QUES1 through QUES8 on their computer screen.
4. Manipulation of independent variables PAYSTRUC and BUDIMP.
5. Subjects play 5 sessions of the Audit Game. The 5th session determines their compensation and chances for winning in a lottery drawing.
6. Subjects answer QUEST1 through QUEST14 on their computer screens.
7. Subjects answer demographic questions.
8. Subjects are paid and given lottery numbers for the drawing to be held one week later.
9. Subjects are allowed to leave as they finish the experiment.

Except for the preliminary instructions, which were read out loud by the experimenter (see Tables A.3 through A.5 in Appendix A), and the written explanation of the applicable reward structure (see Tables A.7 and A.8), the entire task was explained to and completed by subjects on the computer. Thus the computer recorded the answers to all pre-experimental questions (see Table A.6), the manipulation check question (see Table A.20), the post-experimental questions (see Table A.26), and the demographic questions (see Table A.27), in addition to recording the audit game data for each subject. A more detailed description of the entire experimental task is provided in Appendix A.

3.6   Subject Selection

A total of 124 student subjects enrolled in senior level accounting classes participated in the experimental task. Students were asked to participate by the experimenter during a short announcement made in various accounting classes. Thus participation was voluntary and students received no benefit from signing up for the experiment other than the compensation they received and the experience of participating. Students were able to choose the experimental session most convenient to their schedule. Thus subjects self-selected a particular experimental session.

As discussed in Chapter 1, student subjects were used in this study for several reasons. First, students were expected to have little or no audit experience. Consequently, the probability that confounding variables such as past reporting

behaviors, different reward systems and differences in the cultures of different public

accounting firms would influence the behavior of the experimental subjects was

minimized. Second, the independent reward structure variables of interest are

economic-based. Students were expected to have lower wealth relative to auditors

and, therefore, were considered more likely to be motivated by the economic

incentives available in this study (Ashton and Kramer, 1980). Finally, Ashton and

Kramer (1980, p.1) state that "studies that have focused on decision making have

found considerable similarities in the decisions...of student and nonstudent groups."

In addition, it seems reasonable to assume that students enrolled in upper level

accounting classes at a major university are not very different from beginning

staff auditors in a public accounting firm with regard to work experience or age.

Table 3.8
Demographic Information for Student Subjects

Academic Experience	Senior	Junior	Totals
Accounting Major	107	2	109
Finance Major	15	0	15
Totals	122	2	124

Public Accounting Exposure	Attended C&L Ethics presentation	Did not attend Ethics presentation	Totals
Internship	2	11	13
No Internship	8	103	111
Totals	10	114	124

Table 3.8 presents demographic information for the student subjects who participated in this study.

3.7 Operational Definitions of Independent and Mediating Variables

The operationalization of each of the independent variables and post-experimental statements was tested first using doctoral students and second in a pilot test of the experiment that included 40 students enrolled in an intermediate accounting class. The final operational definitions were the result of these two preliminary tests.

3.7.1 Salary Structure

Salary structure was manipulated between subjects as a dichotomous variable. The overtime salary structure provided subjects with a base salary of $1.00 per "hour" worked and reported, and also provided the opportunity to earn overtime pay of $1.40 per "hour" worked and reported in excess of eight hours.[5] Since the time budget for completing the Division Five audit procedures was ten hours, subjects in the overtime salary structure condition earned $10.80 if they worked and reported at least those ten "hours." If they worked fewer "hours" than the ten hour budget, they were paid only for the "hours" worked and reported.[6] The straight salary structure

---

[5] KPMG Peat Marwick still pays overtime at the rate of time and a half the normal salary rate of its employees. Other firms who pay overtime generally pay it at the normal salary rate. $1.40 falls between these two extremes and is, therefore, considered a realistic overtime rate.

[6] The computer game was designed to preclude subjects from reporting more hours than they had actually worked. Thus, overreporting was not possible in this experimental task.

provided subjects with a base salary of $10.80 for participating in the experiment regardless of the "hours" worked and reported. Thus the expected value of the compensation paid to overtime subjects was equal to that paid to straight salaried subjects up to the point of exceeding the time budget.[7] This part of the manipulation was considered important because it equalized salary conditions up until the time budget was used up. Once the time budget had been used up, only the overtime subjects were eligible to receive additional salary for working hours in excess of the time budget.

3.7.2 Time Budget Importance

Time Budget Importance was operationalized by manipulating the level of influence that meeting the time budget had on the subject's performance evaluation through the use of a written evaluation message, the specification of the number of lottery chances earned, and the specification of the probability of winning a cash bonus, all of which appeared on the Performance Evaluation document (see Tables A.18 and A.19). The experiment was designed so that all subjects received all possible audit quality points, thus holding audit quality constant across subjects. Consequently, the performance evaluation was purely a result of whether or not the

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[7]Price Waterhouse pays a straight salary to its employees (without considering year end bonuses), but offers a starting salary that exceeds that of the other Big Six firms by approximately ten percent. This ten percent compensates their new employees for about 200 hours of overtime, which they claim is the average overtime worked by staff auditors. Consequently, the expected value of their straight salary is comparable to the expected value of the salary of other public accounting firms who pay overtime in addition to the lower starting salary. The manipulation of the salary structures in this study is based on these real world reward structures and is therefore considered to be quite realistic.

time budget had been met.

Subjects in the Low Time Budget Importance condition received one of two messages, depending on whether the time budget had been reportedly met or not. Both messages in this condition emphasized the importance of performing a quality audit and congratulated subjects on their quality performance. The messages that appeared on the performance evaluations of subjects participating in the High Time Budget Importance condition emphasized meeting the time budget and did not mention audit quality (see Table A.21).

The number of lottery chances earned was calculated using the formulas presented in Table 3.9. The formulas are identical for each of the two time budget importance conditions except for the weights assigned to the total "Quality" and "Time Budget" points earned during the audit game. Points for audit quality and time budget were weighted 5 to 1 respectively for subjects in the Low Time Budget Importance condition, while the weighting was 1.75 to 4.25 respectively for subjects in the High Time Budget Importance condition. Thus achieving audit quality was much more important than was meeting the time budget in the Low Time Budget Importance condition, while meeting the time budget was much more important than achieving audit quality in the High Time Budget Importance condition with regard to winning a cash bonus in the audit game.

Table 3.9
Formulas for Calculating Number of Lottery Chances Earned

High Time Budget Importance:	$$\frac{.75[(w_{QH}Q + w_{TH}T) - (w_{TH}/w_{QH})(TA-T)]}{[(w_{QH}+w_{TH})QA]/N}$$
Low Time Budget Importance	$$\frac{.75[(w_{QL}Q + w_{TL}T) - (w_{TL}/w_{QL})(TA-T)]}{[(w_{QL}+w_{TL})QA]/N}$$

where:	
$w_{QH} = 1.75$	weight for Quality points earned under High Time Budget Importance
$w_{TH} = 4.25$	weight for Time Budget points earned under High Time Budget Importance
$w_{QL} = 5.00$	weight for Quality points earned under Low Time Budget Importance
$w_{TL} = 1.00$	weight for Time Budget points earned under Low Time Budget Importance
$QA = 100$	number of Quality points Available in the game
$TA = 100$	number of Time Budget points Available in the game
$N = 32$	number of subjects assigned to the condition[8]
H	High Time Budget Importance
L	Low Time Budget Importance
Q	number of Quality points earned in the audit game (held constant at 100 points)
T	number of Time Budget points earned in the audit game (point range 0 to 100)

The formula to calculate the probability of winning a cash bonus is shown in Table 3.10. The formula is based on the assumption that all other subjects participating in the audit game would earn 24 lottery chances. Thus the probability provided to subjects on their performance evaluation was the minimum probability of winning a bonus.[9] The range for each of the variables in the formula is the direct

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[8]The actual number of subjects assigned to each cell was 31, instead of the 32 that was designed into the calculation. This is not considered to be important to the results of the experimental study.

[9]As the number of lottery numbers earned by other participating subjects decreased, the probability of one particular subject winning a cash bonus actually went up. However, this increased probability was not provided to subjects since there was no way of knowing what other subjects were reporting during the experiment.

result of the weighting of audit quality and time budget points discussed above, with one exception. Table 3.10 shows that the minimum values for L and p in the High Time Budget are 1 lottery chance and a 3% probability of winning a cash bonus respectively. Both of these items would be zero according to the formulas in Tables 3.9 and 3.10 if the subject working under the High Time Budget Importance condition had completed the procedures and reported "hours" worked honestly (see Tables A.23 and A.25). In order to provide all subjects with some chance of winning a cash bonus, the values for these two items were set by the experimenter at 1 chance and 3% respectively.

Table 3.10
Formula for Calculating Probability of Winning a Cash Bonus

$p_L = 1 - \{24[(N-1)-(L-1)]/[(24(N-1)+24)-24(L-1)]\}\{1-p_{(L-1)}\}$
where: N = Number of subjects (32) L = Lottery chances earned*
when Time Budget Importance = High: range for L was 1 to 24 range for p was 3% to 75%
when Time Budget Importance = Low: range for L was 19 to 24 range for p was 60% to 75%
* calculated from formula in Table 3.2

The maximum probability of 75% of winning a cash bonus was set arbitrarily by the experimenter. The lottery was designed to resemble the "up or out" promotion process found in public accounting firms. Consequently, it would be unrealistic to allow all subjects to win a bonus, i.e., be promoted. As a result of incorporating probability in the "promotion decision" in addition to performance, it was possible

that subjects who earned a perfect score in the audit game would not receive a bonus. The rationale behind incorporating the possibility that the highest scoring subjects would not receive a bonus was that rewards earned by staff auditors in the real world are not strictly dependent on their ability to achieve audit quality and to meet time budgets. Alternatively, the use of the lottery provides some "gambling" space to subjects who decide to honestly report budget overruns, resulting in fewer total points, by allowing them some chance to receive a bonus anyway.

There were three levels of cash bonuses available to subjects. These levels were intended to proxy for the different levels of rewards available in public accounting firms. For example, salary increases across audit staff vary; some auditors may get a good raise plus better clients, in addition to being placed on a "fast track" to move up through the firm hierarchy, while others receive only mediocre rewards. The cash bonuses were set arbitrarily by the experimenter at $20 for the first one third of the lottery numbers drawn for each condition (or for 25% of the subjects participating in each condition), $12 for the second third, and only $5 for the last third. Thus, subjects who earned more points during the experiment had a higher probability of having their numbers drawn, and also drawn sooner, in the lottery.

Tables A.22 through A.25 illustrate all of the calculations of the lottery chances earned and the probabilities attached to those chances for each time increment that the time budget was exceeded.[10] In addition, the tables combine the salaries

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[10]Each "hour" was divided into four time increments. The audit procedures for Division Five, if completed, caused the subject to exceed the time budget by 5 hours, or 20 time increments. Lottery chances and probabilities of winning were calculated for each of the 20 time increments (see Tables A.22 through A.25).

earned with the expected value of the potential cash bonus to provide the expected

value of the total compensation to be earned from participating in the experimental

task, given the extent to which the subject reportedly met the time budget.

Following each of the five audit game sessions, subjects were required to

answer the question presented in Table 3.11 concerning their perception of the

importance of meeting the time budget as it related to receiving a positive

performance evaluation.

Table 3.11
Descriptive Statistics for Time Budget Importance Manipulation Check

Manipulation check question: Based on the Performance Evaluation you just received for Division Five, what level of importance do you feel your supervisor assigned to your ability to meet the time budget?			
	Level of Budget Importance		
	High	Low	t-statistics
IMPORT			
Mean	4.90	4.45	t value = -1.63 one-tail p = .053
Std. Dev.	1.72	1.34	
Sample size	62	62	
The theoretical range of this variable is from 1 ("not at all important") to 6 ("extremely important").			

This question was intended to be a manipulation check to determine whether the

operationalization of time budget importance was successful. The analysis considered

the responses to this question for only the fifth session of the audit game since that

was the session that determined the compensation subjects would earn for participating

in the experimental task. The statistics presented in Table 3.11 show that the level of

time budget importance (IMPORT) experienced by subjects working in the high time budget importance condition was significantly higher than that experienced by subjects working in the low time budget importance condition (one-tail p < .053).

3.7.3 Measurement of Ethical Ambivalence

Ethical ambivalence is a psychological construct that cannot be directly observed or measured. Consequently, questionnaires were developed (one pre-experimental and the other post-experimental) for the purpose of providing observed variables to be used in a confirmatory factor analysis. These observed variables consisted of subject responses to the statements on the questionnaires. The factor analysis provided factor scores which provided an indirect measure of the latent, or unobservable, ethical ambivalence variable.

The items included in the pre-experimental questionnaire consisted of statements intended to capture the level of conflict perceived by subjects between firm expectations and reward structure of accounting firms in general. The only basis that most subjects had for their perceptions at this point in the experimental task was the "Information on Reporting Policy" document that had been provided to them (see Table 3.6). The post-experimental questionnaire consisted of statements that referred to the experience the subjects had during the audit game.[11] The intent of this second questionnaire was to capture the level of conflict experienced by subjects between the

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[11]The actual pre-experimental and post-experimental statements used in the experiment are illustrated in Tables A.6 and A.26 respectively. A shortened version of each statement is presented along with the factor analysis statistics for each set of statements in Tables 3.12 and 3.13.

firm expectations and reward policy of the accounting firm for whom they had just

finished working. In addition, statements that were intended to measure personal

ethics were included in both the pre- and post-experimental questionnaires. These

"personal ethics" statements were included as control variables and were expected to

load on a different factor than the statements dealing with conflict, or ethical

ambivalence.

Table 3.12
Factor Analysis of Pre-Experimental Questions

Factor Analysis for QUES1 to QUES8 N=124	Rotation Method=Oblique	
Factor Names	Factor Loadings	Reliability Alphas
1. Conflict regarding Underreporting (CONFLUR)	Eigenval=1.7 % of Variance=20.8	.57
QUES1 incentives to underreport QUES2 expects underreporting QUES4 rewards discourage underreporting	.98470 .50379 .33192	
2. Dishonesty Comfort Level (OK)	Eigenval=1.2 % of Variance=15.2	.79
QUES7 underreporting OK anytime QUES8 signing off OK anytime	-.99053 -.68868	
3. Conflict regarding Signing Off Early (CONFLSO)	Eigenval=1.1 % of Variance=13.7	.59
QUES5 expects signing off QUES3 incentives to sign-off QUES6 rewards discourage signing off	.68060 .63037 .42634	

Three factors were derived from each of the factor analyses performed on the

pre- and post-experimental questionnaire items. These factors consisted of two ethical

ambivalence factors, "Conflict regarding Signing Off Early" and "Conflict regarding

Underreporting", and as expected, one personal ethics factor "Dishonesty Comfort

Level". Tables 3.12 and 3.13 present the factor analysis statistics for the pre-

experimental and post-experimental questionnaires respectively. Table 3.14 presents

descriptive statistics based on the mean response calculated for each factor.[12]

Table 3.13
Factor Analysis of Post-Experimental Questions

Factor Analysis QUEST1 to QUEST14 N=124	Rotation Method=Oblique	
Factor Names	Factor Loadings	Reliability Alphas
1. Conflict regarding Signing Off Early (CONFLTSO)	Eigenval=4.1 % of Variance=29.5	.78
QUEST7 incentives to sign off despite policy QUEST2 rewards give incentives to sign off QUEST9 rewards discourage signing off QUEST4 expects signing off QUEST5 sign off policy consistent with rewards	.93278 .77628 .66737 .49579 .35966	
2. Dishonesty Comfort Level (OKDISHON)	Eigenval=1.7 % of Variance=12.4	.71
QUEST11 underreporting OK under circumstances QUEST13 signing off OK under circumstances QUEST12 underreporting OK any time QUEST14 signing off OK any time	.80955 .76345 .48529 .43557	
3. Conflict regarding Underreporting (CONFLTUR)	Eigenval=1.0 % of Variance=7.4	.81
QUEST8 rewards give incentives to underreport QUEST3 incentives to underreport despite policy QUEST1 rewards discourage underreporting QUEST6 expects underreporting QUEST10 underreport policy consistent with rewards	.81685 .71764 .66248 .60935 .60423	

The confirmatory factor analysis was considered a necessary preliminary step

to the path analysis using LISREL, discussed in Chapter 4, for two reasons. First, it

was important to ascertain that the statements used in the experiment did in fact load

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[12]This calculation consisted of adding the mean responses for the statements that loaded on a particular factor and dividing by the number of statements included in the factor.

on the two expected factors of ethical ambivalence and personal ethics. The factor analysis extracted two ethical ambivalence factors and one personal ethics factor. One ethical ambivalence factor represents the ethical ambivalence relating to underreporting (CONFLTUR), the second represents the ethical ambivalence relating to signing off on incomplete audit procedures (CONFLTSO), while the third factor represents personal ethics, or the dishonesty comfort level (OKDISHON).[13] The two ethical ambivalence factors are highly correlated. As a result of the factor analysis, two ethical ambivalence latent variables are incorporated into the final causal model discussed in Chapter 4.

Although two ethical ambivalence factors were not expected, this is not a surprising result since signing off on incomplete audit procedures has more serious long-term ramifications for both the firm and the individual than does underreporting the number of hours worked. Consequently, it makes sense that if subjects did not consider underreporting to be as serious an offense as they did signing off on incomplete audit procedures, they might feel differently about the firm's expectations concerning these two reporting behaviors. This idea is supported by Table 3.14, which shows a lower overall mean for ethical ambivalence for signing off early (CONFLTSO) as compared to that for underreporting hours (CONFLTUR). It seems reasonable that ethical ambivalence would be lower for a more serious offense than it would for an offense that has fewer negative ramifications for the individual if caught,

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[13]The factor analyses run on the pre-experimental questions and the post-experimental questions used the maximum likelihood extraction technique and the direct oblimin rotation method. The number of factors was limited to three for each set of questions.

Table 3.14
Descriptive Statistics for Mediating Variables

Variable	Cell Means (N = 31 for all cells)				All Subject Mean	Overall Std. Dev.
	Overtime Salary		Straight Salary			
	Low Import	High Import	Low Import	High Import		
Pre-experimental analysis: Mediating Variables						
CONFLSO (Factor)[a,b]	2.67	2.54	2.46	2.54	2.55	.85
CONFLUR (Factor)[a,c]	2.98	2.74	3.05	2.86	2.91	.89
OK (Factor)[a,d]	1.79	2.00	1.90	1.98	1.92	.88
Post-experimental analysis: Mediating Variables						
CONFLTSO (Factor)[a,e]	3.56	4.26	3.96	4.68	4.12	1.09
CONFLTUR (Factor)[a,f]	3.63	4.57	4.54	4.94	4.42	1.12
OKCIRCUMSTANCE[a,h]	2.94	3.15	2.84	3.31	3.06	1.39
OK2[a,d]	2.00	2.10	1.58	1.74	1.85	.70
OKDISHON (Factor)[a,g]	2.47	2.62	2.21	2.52	2.46	.90

[a] The theoretical range of this variable is from 1 ("strongly disagree") to 6 ("strongly agree"). The mean and standard deviation are the result of summing scores of the applicable post-experiment questions and dividing by the number of questions that loaded on the factor.

[b] The pre-experimental variable CONFLSO includes QUES3, QUES5, and QUES6.

[c] The pre-experimental variable CONFLUR includes QUES1, QUES2, and QUES4.

[d] The pre-experimental variable OK includes only QUES7 and QUES8. The post-experimental variable OK2 includes only QUEST12 AND QUEST14, which were identical to QUES7 and QUES8.

[e] The post-experimental variable CONFLTSO includes QUEST2, QUEST4, QUEST5, QUEST7, and QUEST9.

[f] The post-experimental variable CONFLTUR includes QUEST1, QUEST3, QUEST6, QUEST8, and QUEST10.

[g] The post-experimental variable OKDISHON includes QUEST11, QUEST12, QUEST13, and QUEST14.

[h] The post-experimental variable OKCIRCUMSTANCE includes QUEST11 and QUEST13.

or for the firm in general. However, it is interesting to note that the means for the two ethical ambivalence factors are nearly identical under the overtime/low time

budget importance condition (3.56 for CONFLTSO and 3.63 for CONFLTUR), which is considered the optimal reward structure for attaining honest reporting behavior within public accounting firms.

The reliability of the factors extracted from the pre-experimental and post-experimental statements was assessed by computing Cronbach's coefficient alphas. These alphas are reported in Tables 3.12 and 3.13 respectively.

The mean responses for the post-experimental statements intended to measure ethical ambivalence were expected to be higher than the mean responses for the associated pre-experimental statements. Alternatively, the mean responses for the statements intended to measure personal ethics were not expected to be different before and after the audit game. These expectations were strongly supported. Table 3.14 shows that the overall means for the pre-experimental "ethical ambivalence" factors CONFLSO and CONFLUR are significantly lower than those for the post-experimental factors CONFLTSO and CONFLTUR respectively (p < .000), while there is no significant difference between the overall pre-experimental "personal ethics" variable OK and the post-experimental variable OK2 (p < .454). In addition, the mean differences for the ethical ambivalence factors by condition were also significant (see Table 3.15). The ideal result for these differences by condition would be no significant difference in the pre- and post-experimental responses for the overtime/low time budget importance condition and a significant difference for the other three conditions. Although the difference for the overtime/low time budget importance condition was much lower than those for the other three conditions, it was

still significant. This larger than ideal difference is attributed to subjects basing their

pre-experimental responses on information they had read about public accounting firm

policy and reporting behaviors of others, whereas their post-experimental responses

were based on the actual experience they had in the experimental audit game.

Table 3.15
Pre and Post Experimental Ethical Ambivalence Differences

Mean Difference (P Value)	Condition				
Variable	Overtime/ Low Import	Overtime/ High Import	StrSalary/ Low Import	StrSalary/ High Import	All Subjects
CONFLTSO	.89 (.002)	1.72 (.000)	1.50 (.000)	2.14 (.000)	1.57 (.000)
CONFLTUR	.65 (.007)	1.83 (.000)	1.49 (.000)	2.08 (.000)	1.51 (.000)

The second reason for the confirmatory factor analysis was to confirm the

expectation that the two independent variables of salary structure and time budget

importance did not affect the subjects' responses to the control statements intended to

measure personal ethics. Once this expectation was confirmed, these statements could

be left out of the path model, making the final analysis less complicated and more

efficient in terms of computer time. An analysis of variance test was run to confirm

that salary structure and time budget importance had no effect on personal ethics.

Neither variable had a significant effect on subjects' dishonesty comfort level. These

ANOVA results are presented in Table 3.16.

It should be noted that the factor scores calculated in the preliminary

confirmatory factor analysis are not used as input in the final path analysis using

Table 3.16
Descriptive Statistics and Summary ANOVAs for OKDISHON

Panel A: Means, Standard Deviations, and Cell Sizes			
Cell	Mean	St.Dev.	N
Overtime			
LO Budimp	.056	.80	31
HIGH Budimp	.114	1.04	31
Straight Salary			
LO Budimp	-.189	.91	31
HIGH Budimp	.019	.90	31
Total	.000	.91	124

Panel B: Summary ANOVA Tables			
Source	Mean Sq.	t-stat.	Prob
PAYSTRUC	.90	1.04	.303
BUDIMP	.55	.81	.420
PAYSTRUC X BUDIMP	.18	.46	.649
Error	.84		

The dependent variable OKDISHON used in the ANOVA is the regression factor score[a] for the Dishonesty Comfort Level factor extracted in the confirmatory factor analysis presented in Table 3.13. The factor score was used because it is considered a more accurate representation of the factor than the mean response calculation presented in Table 3.14.

[a] The regression estimate method of calculating the factor score was used because it is considered to provide the maximum correlation between the underlying common factor and the calculated factor score (Kim and Mueller, 1978).

LISREL. Instead, each of the post-experimental statements found to load on the ethical ambivalence factors (QUEST1 through QUEST10) is included in the model as an endogenous observed variable. This allows LISREL to perform its own confirmatory factor analysis using the polychoric correlation matrix presented below. As a result, the factor loadings presented in Chapter 4 are somewhat different than those shown in Tables 3.12 and 3.13. However, the two ethical ambivalence factors, or latent endogenous variables, extracted in the path analysis include the same observed endogenous variables respectively as the two factors extracted in the

preliminary factor analysis.

3.8 Correlation Analysis

Path analysis using LISREL requires a correlation matrix for data input. When one or more of the variables being analyzed are ordinal and, therefore, not normally distributed, a polychoric correlation has been shown to be the best type of correlation to use as the input matrix (Joreskog & Sorbom, 1988). The polychoric correlation is "an estimate of the correlation in the latent bivariate normal distribution representing two ordinal variables," as opposed to a simple correlation between two sets of ordinal scores. Polychoric correlations run on ordinal data have been shown to be the least biased, to have the smallest mean square error, and to be a consistent and more true estimator of p than other types of correlations. The correlation matrix of ordinal variables presented in Table 3.17 is polychoric and the matrix of ordinal and continuous variables presented in Table 3.18 is polyserial. The matrix of the continuous dependent variables presented in Table 3.19 is a Pearson product moment matrix. These correlation matrices are the data input for the path analysis using LISREL discussed in Chapter 4. The matrices were calculated from raw data using PRELIS, which is a preprocessor program for LISREL.

Table 3.17
Polychoric Correlation Matrix of Independent and Endogenous Observed Variables

PC	QUEST1	QUEST2	QUEST3	QUEST4	QUEST5	QUEST6
QUEST1	1					
QUEST2	.542 (.000)	1				
QUEST3	.559 (.000)	.487 (.000)	1			
QUEST4	.207 (.021)	.321 (.000)	.160 (.075)	1		
QUEST5	.370 (.000)	.419 (.000)	.280 (.000)	.055 (.547)	1	
QUEST6	.386 (.000)	.263 (.003)	.510 (.000)	.408 (.000)	-.006 (.947)	1
QUEST7	.601 (.000)	.790 (.000)	.640 (.000)	.520 (.000)	.333 (.000)	.355 (.000)
QUEST8	.622 (.000)	.539 (.000)	.792 (.000)	.141 (.118)	.271 (.002)	.617 (.000)
QUEST9	.602 (.000)	.641 (.000)	.545 (.000)	.262 (.003)	.538 (.000)	.243 (.006)
QUEST10	.671 (.000)	.406 (.000)	.504 (.000)	.141 (.119)	.383 (.000)	.328 (.000)
BUDIMP	.398 (.000)	.328 (.000)	.364 (.000)	.336 (.000)	.172 (.057)	.325 (.000)
PAYSTRUC	.298 (.000)	.345 (.000)	.366 (.000)	.031 (.733)	.046 (.615)	.049 (.590)

PC	QUEST7	QUEST8	QUEST9	QUEST10	BUDIMP	PAYSTRUC
QUEST8	.604 (.000)	1				
QUEST9	.717 (.000)	.492 (.000)	1			
QUEST10	.487 (.000)	.548 (.000)	.508 (.000)	1		
BUDIMP	.409 (.000)	.336 (.000)	.300 (.000)	.221 (.013)	1	
PAYSTRUC	.280 (.000)	.364 (.000)	.143 (.112)	.364 (.000)	.000 (1.00)	1

Table 3.18

Polyserial Correlation Matrix of Observed Endogenous and Dependent Variables

PS	QUEST1	QUEST2	QUEST3	QUEST4	QUEST5	QUEST6
PERCNTSO	.134	.334	.043	.194	.175	.035
	(.139)	(.000)	(.639)	(.031)	(.052)	(.698)
HOURSUR	.172	-.063	.266	.012	-.041	.145
	(.055)	(.491)	(.003)	(.899)	(.651)	(.107)

PS	QUEST7	QUEST8	QUEST9	QUEST10	BUDIMP	PAYSTRUC
PERCNTSO	.223	-.059	.211	.134	.145	.388
	(.012)	(.461)	(.018)	(.195)	(.108)	(.000)
HOURSUR	.026	.288	.005	.230	.137	.237
	(.777)	(.000)	(.956)	(.010)	(.130)	(.008)

Table 3.19

Pearson Product Moment Correlation Matrix
of Dependent Variables

PE	HOURSUR
PERCNTSO	-.302
	(.000)

3.9   Chapter Summary

This chapter explains the experimental procedures, discusses the operational

definitions of the independent and mediating variables, discusses the tests carried out

to determine the level of success achieved in the manipulation of those variables, and

explains the resolution of the problem created by ordinal data. The operationalization

of the latent mediating variable of ethical ambivalence was supported by the results of

preliminary factor analyses. This factor analysis was valuable to the study for several

reasons. First, it was important to determine that the manipulations in the

experimental task created feelings of ethical ambivalence as it is defined in this study. Second, it was important to show that there is a distinction between the pre- and post-experimental statements that measured "ethical ambivalence" and those that measured "personal ethics", or dishonesty comfort level, as defined in this study. The successful separation of these two constructs made it possible to leave the control statements that measured personal ethics out of the final path analysis discussed in Chapter 4. Finally, the factor analyses showed that there were actually two levels of ethical ambivalence experienced by subjects depending on whether the reporting behavior issue related to underreporting hours worked or to signing off on incomplete procedures.

CHAPTER 4

DATA ANALYSIS AND RESULTS

4.1   Overview of Chapter

This chapter presents the results of the statistical analyses used to test the hypotheses developed in Chapter 2. Section 4.2 presents a discussion on the use of LISREL for estimating the path analysis model. Section 4.3 presents the model equations and an illustration of the final path model. In section 4.4, descriptive statistics and the results of the path analysis are presented and discussed in terms of the hypotheses. Section 4.5 provides a summary of results and includes a discussion of the effects of excluding certain subjects based on demographic considerations.

4.2   Using LISREL for Estimating the Path Model

The path model depicted in Figure 4.1 was tested using the LISREL VII program to estimate the coefficients for the set of linear structural equations listed below. LISREL allows estimation of models that include latent variables, reciprocal causation, measurement error, and correlated error terms, all of which are present in the path model estimated in this study (Joreskog and Sorbom 1989, p. 2, 145).

LISREL requires a large sample size and yields optimal results when a covariance matrix is analyzed as opposed to a correlation matrix. These sample size

requirements are even more demanding when non-normal ordinal data are being

analyzed, since the fit of the model is considered optimal for such data when an

asymptotic covariance matrix is produced from a polychoric correlation matrix and

subsequently analyzed using weighted least squares (WLS). An asymptotic covariance

matrix requires a sample size of 200 to be estimated accurately. Consequently, the

LISREL analysis performed in this study is less than optimal since the sample size of

124 precludes the use of an asymptotic covariance matrix. Instead, the maximum

likelihood (ML) method is used to analyze the polychoric and polyserial correlation

matrices presented in Tables 3.17 and 3.18 since when the sample size is small, it is

better to use ML to analyze a polychoric correlation matrix than to risk incorporating

a poorly estimated asymptotic covariance matrix and using WLS (Joreskog and

Sorbom 1989, p. 192-93). At least the use of the polychoric matrix provides some

assurance that the input data approaches normality.

Disregarding the normality issue, the use of a correlation matrix instead of a

covariance matrix as input can be problematic for several reasons (Cudeck 1989;

Joreskog and Sorbom 1989, p. 47-8). It is possible that it may cause the model being

analyzed to be modified, it may produce incorrect chi-square and other goodness-of-fit

measures and it may give incorrect standard errors. However, as long as the model

does not contain constrained parameters, or equality constraints, the problem of model

modification is not an issue. No parameters are constrained to be equal in the path

model estimated in this study. The use of the ML method of analysis on a correlation

matrix, combined with the existence of free parameters on the diagonal of the Θ_ϵ

matrix and an unconstrained joint covariance matrix of η and ξ, provides assurance

that the goodness-of-fit measures and the standard errors can be assumed to be

asymptotically correct. This assumption is supported further by the relatively small

fitted and standardized residuals estimated in the analysis (see Table 4.5) The model

in this study meets all of the required conditions discussed above. Therefore, neither

the less than optimal sample size or the potentially non-normal data preclude the use

of LISREL for estimating the path coefficients in the path model in Figure 4.1.

4.3   The Path Model

Table 4.1 provides a summary of variable names and definitions for the

variables included in the path model illustrated in Figure 4.1. The pre- and post-

experimental statements (QUEST1 through QUEST10) are not included in the table

Table 4.1
Summary of Variable Names and Definitions

Variable Name	Definition	Section Reference
PAYSTRUC	Slope dummy variable coded -1 (1) for overtime (straight salary) pay structure.	3.7.1
BUDIMP	Slope dummy variable coded -1 (1) for low (high) level of budget importance.	3.7.2
CONFLTSO	Latent (unobserved) ethical ambivalence factor relating to signing off on incomplete procedures.	3.7.3
CONFLTUR	Latent (unobserved) ethical ambivalence factor relating to underreporting hours worked.	3.7.3
PERCNTSO	Percentage of audit task left incomplete.	4.4.2
HOURSUR	Percentage of hours worked that went underreported.	4.4.2

since they are discussed in detail in Chapter 3 and presented in Tables A.6 and A.26

of the appendix.

Table 4.2 provides a summary of the variable names and their greek letter

counterparts used in the equations below.

Table 4.2
Summary of Equation Variables

η_1 = CONFLTSO	y_3 = QUEST3
η_2 = CONFLTUR	y_4 = QUEST4
η_3 = PERCNTSO	y_5 = QUEST5
η_4 = HOURSUR	y_6 = QUEST6
ξ_1 = PAYSTRUC	y_7 = QUEST7
ξ_2 = BUDIMP	y_8 = QUEST8
y_1 = QUEST1	y_9 = QUEST9
y_2 = QUEST2	y_{10} = QUEST10

The general LISREL model consists of both measurement models and

structural equation models. The structural equations for the path model illustrated in

Figure 4.1 are

$$\eta_1 = \beta_{12}\eta_2 + \gamma_{12}\xi_2 + \zeta_1$$
$$\eta_2 = \beta_{21}\eta_1 + \gamma_{21}\xi_1 + \gamma_{22}\xi_2 + \zeta_2$$
$$\eta_3 = \beta_{31}\eta_1 + \gamma_{31}\xi_1 + \zeta_3$$
$$\eta_4 = \beta_{42}\eta_2 + \zeta_4$$

Since the independent variables are manipulated variables, their measurement

equations are very simple. In addition, since the dependent variables are observed,

their measurement equations are equally simplistic. The measurement equations for

salary structure and time budget importance respectively are

$$x_1 = \xi_1 + \delta_1$$
$$x_2 = \xi_2 + \delta_2$$

while the equations for the dependent reporting variables are

$$y_{11} = \eta_3 + \epsilon_{11}$$
$$y_{12} = \eta_4 + \epsilon_{12}$$

There are ten y-variables (QUEST1 through QUEST10) as indicators of the

two latent ethical ambivalence (η_1 and η_2) variables. Since the ethical ambivalence

variables (CONFLTSO and CONFLTUR) are unobserved, they do not have a definite

scale. Consequently, to define the model properly, the origin and the unit of

measurement of each of these variables must be assigned. To accomplish this, the

values of y_2 and y_8 were fixed at 1.0 since QUEST2 and QUEST8 were determined to

be the observed variables that best represented the CONFLTSO and CONFLTUR

latent variables respectively (Joreskog and Sorbom 1989, p 4-6).[1] The measurement

equations for the latent ethical ambivalence variables (LISREL confirmatory factor

analysis) are

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[1]These observed variables are considered the best representatives of the particular latent variables since none of the λ coefficients of the y variables presented in Table 4.3 exceed the assigned value of 1.0. This means that QUEST2 and QUEST8 have the highest actual λ coefficients, thereby indicating that they best represent CONFLTSO and CONFLTUR respectively. It is interesting to note that QUEST2 and QUEST8 are identical except for their reference to signing off early versus underreporting respectively.

$$y_1 = \lambda_{11}\eta_1 + \lambda_{12}\eta_2 + \epsilon_1$$
$$y_2 = \eta_1 + \epsilon_2$$
$$y_3 = \lambda_{32}\eta_2 + \epsilon_3$$
$$y_4 = \lambda_{41}\eta_1 + \epsilon_4$$
$$y_5 = \lambda_{51}\eta_1 + \epsilon_5$$
$$y_6 = \lambda_{62}\eta_2 + \epsilon_6$$
$$y_7 = \lambda_{71}\eta_1 + \lambda_{72}\eta_2 + \epsilon_7$$
$$y_8 = \lambda_{81}\eta_1 + \eta_2 + \epsilon_8$$
$$y_9 = \lambda_{91}\eta_1 + \epsilon_9$$
$$y_{10} = \lambda_{10,2}\eta_2 + \epsilon_{10}$$

Table 4.3 presents the LISREL results for the measurement equations that

make up the confirmatory factor analysis portion of the path model in Figure 4.1.

The factor loadings are different from the loadings that resulted from the preliminary

factor analysis discussed in Chapter 3 because of the need to assign the origin and

Table 4.3
LISREL Confirmatory Factor Analysis

Parameter	Coefficient (factor loading η_1)	Coefficient (factor loading η_2)	t-stat	p value	reliability
$\lambda^y_{11}, \lambda^y_{12}$	.287	.518	2.000, 3.756	<.10, <.001	.615
λ^y_{21}	1.000*		n/a	<.001	.950
λ^y_{41}	.312		3.589	<.001	.090
λ^y_{51}	.478		5.137	<.001	.212
$\lambda^y_{71}, \lambda^y_{72}$	.591	.251	5.188, 2.773	<.001, <.01	.652
$\lambda^y_{81}, \lambda^y_{82}$	-.245	1.000*	-1.744, n/a	<.10, <.001	.688
λ^y_{91}	.786		8.774	<.001	.578
λ^y_{32}		.820	7.494	<.001	.707
λ^y_{62}		.285	3.419	<.01	.082
$\lambda^y_{10,2}$		.660	6.015	<.001	.453

* Indicates parameters that have been constrained to equal the given value. This constraint is necessary to provide a scale for the unobserved variables.

unit of the latent ethical ambivalence variables as discussed above. The factors

extracted and the variables that loaded on each factor, however, are the same as those

presented in Table 3.13. In addition to the parameter estimates presented in Table

4.3, estimates for the correlated error terms (ϵ's) related to the observed y variables

are presented in Table 4.4.

Table 4.4
Error Covariances for LISREL Factor Analysis

Parameter	Coefficient	Std. error	t-stat	p value
$COR(\epsilon_1,\epsilon_2)$	-.176	.054	-3.267	< .01
$COR(\epsilon_1,\epsilon_3)$	-.093	.041	-2.267	< .05
$COR(\epsilon_1,\epsilon_6)$	.152	.050	3.028	< .01
$COR(\epsilon_1,\epsilon_{10})$	.142	.055	2.580	< .02
$COR(\epsilon_2,\epsilon_3)$	-.229	.052	-4.437	< .001
$COR(\epsilon_2,\epsilon_5)$	-.024	.059	-.405	NS
$COR(\epsilon_2,\epsilon_8)$	-.109	.045	-2.408	< .05
$COR(\epsilon_2,\epsilon_9)$	-.089	.051	-1.759	< .10
$COR(\epsilon_2,\epsilon_{10})$	-.170	.053	-3.219	< .01
$COR(\epsilon_3,\epsilon_6)$	.263	.064	4.130	< .001
$COR(\epsilon_3,\epsilon_8)$	.095	.053	1.798	< .10
$COR(\epsilon_3,\epsilon_{10})$	-.060	.043	-1.390	< .20
$COR(\epsilon_4,\epsilon_6)$	.364	.070	5.213	< .001
$COR(\epsilon_4,\epsilon_7)$	.272	.051	5.361	< .001
$COR(\epsilon_5,\epsilon_6)$	-.107	.053	-2.007	< .10
$COR(\epsilon_5,\epsilon_9)$	.181	.055	3.279	< .01
$COR(\epsilon_5,\epsilon_{10})$	.091	.055	1.660	< .20
$COR(\epsilon_6,\epsilon_7)$	.108	.041	2.611	< .02
$COR(\epsilon_6,\epsilon_8)$	.390	.063	6.207	< .001
$COR(\epsilon_6,\epsilon_{10})$	.137	.054	2.542	< .02
$COR(\epsilon_7,\epsilon_9)$	.100	.042	2.381	< .05

Figure 4.1
Path Model of the Effects of Reward Structure and Ethical Ambivalence on Reporting Behavior
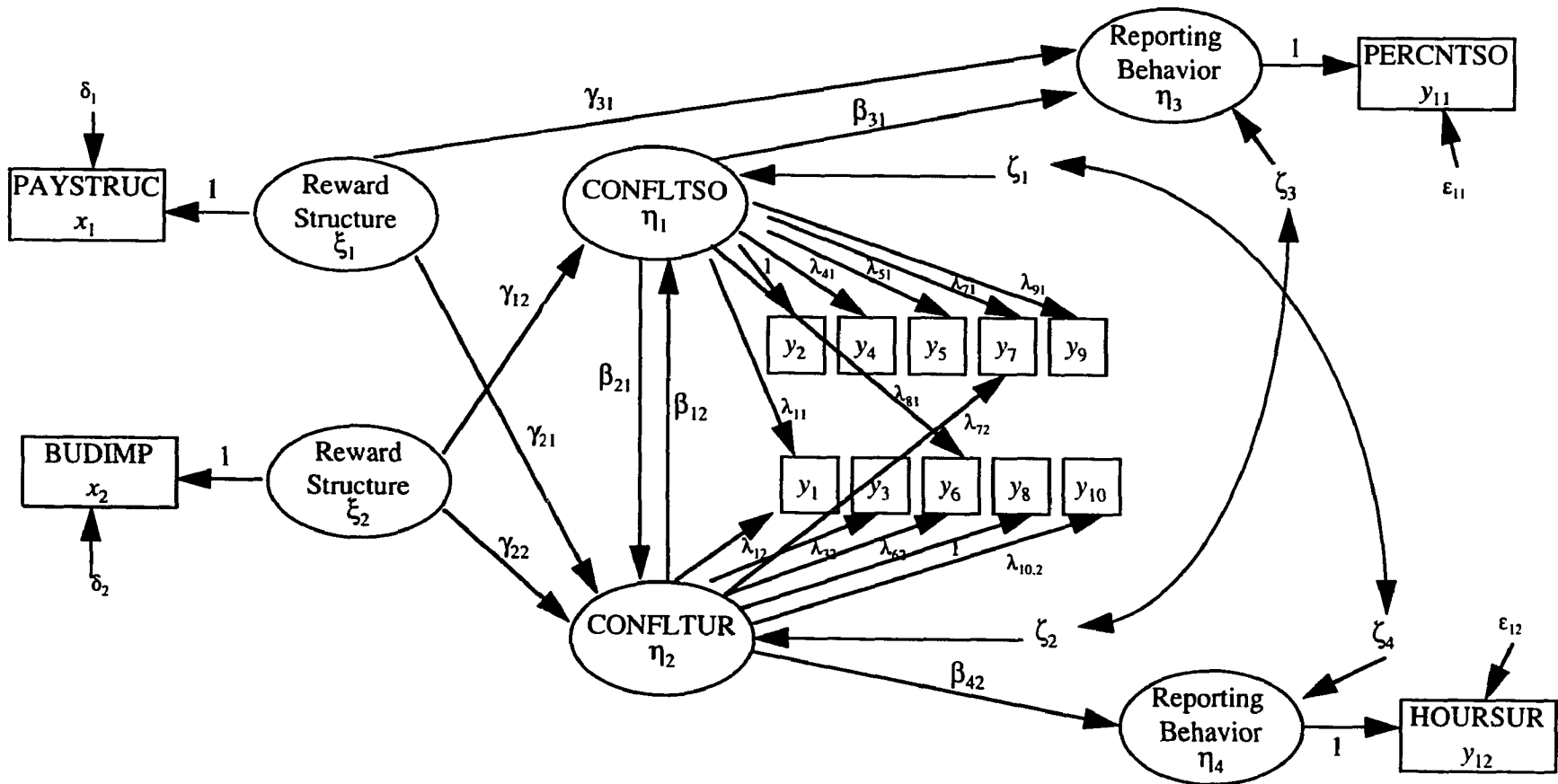
The results of the path analysis are meaningful only if the model shown in Figure 4.1 can be considered a good fit to the data. The goodness of fit statistics, presented in Table 4.5, provide assurance that the path model fits the data well.

Table 4.5
Goodness of Fit Statistics for the LISREL Path Model

Chi-square	49.71
Degrees of Freedom	46
P value	.328
Goodness of Fit Index	.949
Adjusted Goodness of Fit Index	.885
Root Mean Square Residual	.058
Coefficient of Determination for Structural Equations	.878
Squared Multiple Correlations for Structural Equations (R^2's): 　　　Ethical Ambivalence for Signing Off Early (η_1) 　　　Ethical Ambivalence for Underreporting (η_2) 　　　Percentage Left Incomplete (η_3) 　　　Percentage of Hours Underreported (η_4)	 .708 .750 .045 .027
Largest eigenvalue of Matrix B*B' (stability index)	.721
Summary statistics for fitted residuals (unstandardized): 　　　Smallest fitted residual 　　　Median fitted residual 　　　Largest fitted residual Summary statistics for standardized residuals: 　　　Smallest standardized residual 　　　Median fitted residual 　　　Largest fitted residual	 -.104 .012 .245 -1.466 .239 2.899*
* Only two residuals exceeded the value of 2.58, which is considered the cut-off for deviations from normality.	

The P-value reported is the probability level of χ^2, or the probability of obtaining a χ^2-value larger than the value actually obtained, given that the model is correct (Joreskog and Sorbom 1989, p. 43). The insignificant P-value of .328 is an indication that the model fits the data. The goodness of fit is supported further by the

high goodness of fit measures, the low root mean square residual and the very high coefficient of determination. The coefficient of determination of .878 indicates that the strength of the joint relationship of the four structural equations is very high. The individual R^2's indicate that the strength of the linear relationships for the ethical ambivalence variables are high, while that for each of the dependent variables is much lower. The low squared multiple correlations for the PERCNTSO and HOURSUR variable equations are probably due in part to the correlations between the error terms of those variables and the error terms of the ethical ambivalence variables (CONFLTSO and CONFLTUR, see Figure 4.1 and Table 4.6). However, the low strength of these two structural equations is not considered to be a major weakness in the study, given the large coefficient of determination for the overall model.

The stability index of .721 provides assurance that stability exists in the system of structural equations, which may be lacking in a non-recursive model such as the model used here. As long as the stability index is less than one, a sufficient condition for convergence exits and the reciprocal effects of η_1 and η_2 can be estimated (Joreskog and Sorbom 1989, p. 34-5). The reciprocal effects were included in the model due to the high correlation (.53) between the two ethical ambivalence factors.[2]

Based on the goodness of fit indices, the parameter estimates from the path model presented in Tables 4.3 and 4.6 are considered to be fair indicators of the relationships predicted by the hypotheses upon which the path model is based. These

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[2]The .53 correlation is a Pearson correlation between the two factor scores computed in the preliminary confirmatory factor analysis discussed in Chapter 3.

estimates are discussed in terms of the hypotheses developed in Chapter 2 in the

following section.

4.4   Discussion of Results

This section presents the results of the path analysis (see Tables 4.6, 4.7 and

4.8) and descriptive statistics (see Tables 4.9 and 4.10). These results are discussed

in terms of the hypotheses generated in Chapter 2. The ramifications of these results

for public accounting firms are discussed in Chapter 5.

4.4.1 Determinants of Ethical Ambivalence

Hypothesis 1 predicted that subjects working under high time budget

importance would experience more ethical ambivalence than would subjects working

under low time budget importance. This prediction was strongly supported. The

regression coefficients estimated for the direct effect of BUDIMP (γ_{12} and γ_{22}) in the

structural equations for η_1 (CONFLTSO) and η_2 (CONFLTUR) are positive and

significant at the .05 and the .025 level respectively (see Table 4.6).

Hypothesis 2 predicted that subjects working under a straight salary structure

would experience more ethical ambivalence than would subjects working under an

overtime salary structure. This prediction was strongly supported. The regression

coefficient estimated for the direct effect of PAYSTRUC (γ_{21}) in the structural

equation for η_2 (CONFLTUR) is positive and significant at the .0005 level (see Table

Table 4.6
Path Coefficients using LISREL Analysis

Parameter	Coefficient	Std. error	t-stat	p value
γ_{12}	.122	.062	1.964	<.05[a]
γ_{21}	.370	.064	5.744	<.0005[a]
γ_{22}	.136	.058	2.325	<.025[a]
γ_{31}	.160	.103	1.550	<.10[a]
β_{12}	.594	.111	5.365	<.0005[a]
β_{21}	.509	.179	2.845	<.005[a]
β_{31}	.680	.175	3.876	<.0005[a]
β_{42}	.484	.131	3.681	<.0005[a]
COR(ζ_3,ζ_2)	-.411	.102	-4.033	<.001
COR(ζ_4,ζ_1)	-.306	.075	-4.100	<.001
[a] one-tail p				

4.6). Although there is not a significant direct effect of PAYSTRUC on ethical

ambivalence relating to signing off early (CONFLTSO), the indirect effect of

PAYSTRUC on (CONFLTSO) is positive and significant at the .0005 level (see Table

4.7). The estimated regression of η_1 on η_2 and ξ_2 is, with standard errors in

parentheses,

$$CONFLTSO = .594(.111)CONFLTUR + .122(.062)BUDIMP + \zeta_1$$

The estimated regression of η_2 on η_1, ξ_1 and ξ_2 is, with standard errors in parentheses,

$$CONFLTUR = .509(.179)CONFLTSO + .370(.064)PAYSTRUC +$$
$$.136(.058)BUDIMP + \zeta_2$$

It is interesting that salary structure (PAYSTRUC) had a highly significant

positive effect on ethical ambivalence for underreporting hours (CONFLTUR), but

did not directly effect ethical ambivalence for signing off on incomplete audit

procedures. Once again, this difference is attributed to the assumption that subjects

considered signing off early to be a more serious offense than underreporting hours.

Table 4.7
Direct and Indirect Effects of Independent Variables on Mediating Variables

Effect	Direct Effect coeff.	Indirect Effect coeff./SE (*p*-value)[a]	Total Effect coeff.
PAYSTRUC on CONFLTSO	.000	.314/.069 (<.0005[b])	.314
PAYSTRUC on CONFLTUR	.370	.160/.057 (<.005[b])	.530
BUDIMP on CONFLTSO	.122	.168/.040 (<.0005[b])	.290
BUDIMP on CONFLTUR	.136	.147/.060 (<.01[b])	.283
[a] *p*-values for the indirect effects were determined based on the *t*-statistic, which was calculated by dividing the coefficient by its standard error. [b] one-tail *p*.			

The means for CONFLTSO and CONFLTUR presented in Table 3.14, further

support the predicted relationships.

4.4.2 Determinants of Reporting Behavior

4.4.2.1 *Ethical Ambivalence*

Hypotheses 3A and 3B predicted that subjects who experienced higher levels

of ethical ambivalence would be more likely to sign off on incomplete procedures

(PERCNTSO) and to underreport hours (HOURSUR) respectively than would subjects

who experienced lower levels of ethical ambivalence.[3] The results presented in Table 4.6 show strong support for both hypotheses. The regression coefficients estimated for the effects of CONFLTSO and CONFLTUR (β_{31} and β_{42}) in the structural equations for η_3 (PERCNTSO) and η_4 (HOURSUR) show there is a positive relationship between level of ethical ambivalence and dishonest reporting behavior. These path coefficients are both significant at the .0005 level. The estimated regression of η_3 on η_1 and ξ_1 is, with standard errors in parentheses,

$$PERCNTSO = .680(.175)CONFLTSO + .160(.103)PAYSTRUC + \zeta_3$$

The estimated regression of η_4 on η_2 is, with the standard error in parentheses,

$$HOURSUR = .484(.131)CONFLTUR + \zeta_4$$

4.4.2.2 *Salary Structure and Time Budget Importance*

Hypotheses 4A and 4B predicted that subjects working under an overtime salary structure would be less likely to sign off on incomplete procedures and to underreport hours respectively than would subjects working under a straight salary structure. Hypothesis 4A is weakly supported, while hypothesis 4B is supported only in terms of a significant indirect effect of salary structure (PAYSTRUC) on underreporting (HOURSUR), which is transmitted through the mediating variable of ethical ambivalence for underreporting (CONFLTUR). The structural equation for η_3

---

[3]The dependent variable of signing off on incomplete procedures (PERCNTSO) is defined as the percentage of the Division Five audit procedures left incomplete by subjects, despite being reported as complete. The dependent variable of underreporting hours worked (HOURSUR) is defined as the percentage of hours worked on the Division Five audit procedures that went underreported by subjects.

(PERCNTSO) discussed above shows that PAYSTRUC has a positive and slightly

significant (γ_{31} = .160, p < .10) relationship to signing off on incomplete procedures

(PERCNTSO). Table 4.8 shows the significant indirect effects of salary structure

(PAYSTRUC) on the reporting behaviors of signing off on incomplete procedures

(PERCNTSO) and underreporting hours (HOURSUR). The salary structure means

presented in Tables 4.9 and 4.10 provide further support for these hypotheses.

Table 4.8

Direct and Indirect Effects of Independent Variables on Dependent Variables

Effect	Direct Effect coeff.	Indirect Effect coeff./SE (p-value)[a]	Total Effect coeff.
PAYSTRUC on PERCNTSO	.160	.213/.087 (<.01[b])	.373
PAYSTRUC on HOURSUR	.000	.256/.066 (<.0005[b])	.256
BUDIMP on PERCNTSO	.000	.197/.059 (<.005[b])	.197
BUDIMP on HOURSUR	.000	.137/.046 (<.005[b])	.137

[a] p-values for the indirect effects were determined based on the t-statistic, which was calculated by dividing the coefficient by its standard error.
[b] one-tail p.

The level of time budget importance (BUDIMP) did not have, and was not

expected to have, a significant direct effect on reporting behavior. However, Table

4.8 shows that BUDIMP did have a significant indirect effect on both reporting

behaviors. This indirect effect, transmitted through the mediating ethical ambivalence

variables, is further supported by the means presented in Tables 4.9 and 4.10.

Table 4.9
Descriptive Statistics for Percentage of Task Left Incomplete

D=PERCNTSO	PAYSTRUC		
BUDIMP	Overtime	Str/Salary	Totals
Low	Mean=4.85 Std.Dev.=(11.19) N=31	14.04 (19.21) N=31	9.44 (16.27) N=62
High	7.14 (13.00) N=31	20.04 (21.74) N=31	13.59 (18.92) N=62
Totals	5.99 (12.08) N=62	17.04 (20.57) N=62	11.51 (17.69) N=124

Table 4.10
Descriptive Statistics for Percentage of Hours Underreported

D=HOURSUR	PAYSTRUC		
BUDIMP	Overtime	Str/Salary	Totals
Low	Mean=5.56 Std.Dev.=(9.90) N=31	10.35 (13.73) N=31	7.96 (12.12) N=62
High	8.26 (11.44) N=31	13.37 (15.29) N=31	10.81 (13.64) N=62
Totals	6.91 (10.70) N=62	11.86 (14.49) N=62	9.39 (12.93) N=124

4.4.2.3 Decision Process

Finally, the decision made by a subject regarding the extent of completion of the task was expected to be related to the decision regarding the hours reported. However, there was no basis on which to predict the direction of the effect that the preliminary completion decision would have on number of hours reported. Therefore,

no attempt was made to hypothesize this effect.

Table 3.19 shows that the reporting behaviors PERCNTSO and HOURSUR are significantly and negatively correlated (COR = -.302, p = .000). In addition, the results presented in Table 4.6 show that the error terms of the dependent variable PERCNTSO and the mediating variable CONFLTUR are negatively correlated (-.411) and that the error terms of the dependent variable HOURSUR and the mediating variable CONFLTSO are negatively correlated (-.306). Both correlations are significant at the .001 level. Thus it appears that most subjects who decided to engage in dishonest reporting behavior chose one or the other dishonest reporting behavior, but not both. In fact, Table 4.11 shows that a total of 80 subjects engaged in dishonest reporting behavior with 53 subjects underreporting hours, 46 subjects signing off early, and 19 subjects engaging in both behaviors. These data are consistent with the negative correlations discussed above.

Table 4.11
Frequencies for Underreporting and Signing Off Early

Underreport?	Sign Off Early?		
	Yes	No	Totals
Yes	19	34	53
No	27	44	71
Totals	46	78	124

4.4.3 Additional Data Analysis

Additional data analysis was performed on the data in an effort to show the benefits of performing a LISREL analysis as opposed to multivariate regression analysis. In addition, a multivariate regression analysis was performed using binomial dependent variables as opposed to the continuous dependent variables used in the LISREL analysis. The additional analysis is presented in Appendix B.

4.5   Chapter Summary

Table 4.12 summarizes the results of the hypotheses tests. In summary, the results of the study support the causal relationships predicted in the general model presented in Chapter 2. Specifically, time budget importance had a positive, significant effect on the level of ethical ambivalence experienced, a straight salary structure had a significantly more positive effect on the level of ethical ambivalence experienced than did an overtime salary structure, the level of ethical ambivalence had a positive, significant effect on the propensity to engage in dishonest reporting behavior, and a straight salary structure had a more positive effect on the propensity to engage in dishonest reporting behavior than did an overtime salary structure. The possible ramifications of these results for public accounting firms will be discussed in Chapter 5.

Finally, additional testing was performed on four subject pools that were extracted based on the demographic data presented in Table 3.8. This was done in an

Table 4.12
Summary of Results for Tests of Hypotheses

Hypothesis	Result
H1: Subjects working under high time budget importance will experience more *ethical ambivalence* than subjects working under low time budget importance.	Supported
H2: Subjects working under a straight salary structure will experience more *ethical ambivalence* than subjects working under an overtime salary structure.	Supported
H3A: Subjects who experience higher levels of ethical ambivalence will be more likely to *sign off on incomplete procedures* than subjects who experience lower levels of ethical ambivalence.	Supported
H3B: Subjects who experience higher levels of ethical ambivalence will be more likely to *underreport* hours than subjects who experience lower levels of ethical ambivalence.	Supported
H4A: Subjects working under an overtime salary structure will be less likely to *sign off on incomplete procedures* than subjects working under a straight salary structure.	Weakly Supported
H4B: Subjects working under an overtime salary structure will be less likely to *underreport* hours than subjects working under a straight salary structure.	Indirect effect Supported

effort to determine whether differences in academic experience or in the level of

exposure to public accounting firms had a significant effect on the results of this

study.[4] LISREL parameter estimates and descriptive statistics for these four

additional subject pools and the original pool of 124 subjects are presented in Tables

4.13 and 4.14 respectively. Two differences in the results for these subject pools can

be noted from the LISREL estimates presented in Table 4.13. First, the direct effect

of salary structure (PAYSTRUC) on the dependent variable PERCNTSO for the pool

that excludes participants in the ethics presentation, for the pool that excludes juniors,

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[4]It should be noted here that the number of subjects is not equal among the four experimental conditions, or cells, for any of the subpools presented in Tables 4.13 and 4.14. These uneven distributions could affect the outcome of these additional analyses, making the reliability of the results presented somewhat questionable. Table 4.16 provides a summary of these cell distributions.

and for the pool that excludes non-accounting majors was diminished to a non-significant level (see columns 4, 5 and 6 for parameter γ_{31} in Table 4.13). Second, the effect of BUDIMP on the ethical ambivalence variable CONFLTSO for those same three pools is also diminished to a non-significant level (see columns 4, 5 and 6 for parameter γ_{12} in Table 4.13). However, Table 4.14 shows that the means for the ethical ambivalence variables in each of the four additional subject pools are very similar to those of the original pool. The means for the dependent variable PERCNTSO are slightly higher for the pools that exclude subjects with intern experience or those who had attended an ethics seminar presented by a Big Six public accounting firm a few weeks prior to the study. However, these means do not appear to be significantly different from those of the original pool of 124 subjects.[5] Table 4.15 provides a simple correlation matrix of the demographic variables and the independent, mediating, and dependent variables. The table shows that none of independent, mediating, or dependent variables are significantly correlated with the demographic variables. This provides further support that neither level of exposure to public accounting firms or academic experience affected subjects' reporting behavior.

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[5]Since there is a lack of independence between the five demographic-based samples included in Table 4.14, a statistical analysis of the means would not be meaningful and, consequently, was not run. The main purpose of the limited analysis performed on these extraneous samples was to determine that reporting behavior was consistent among subjects regardless of their level of exposure to public accounting firms and/or their academic experience. The means in Table 4.14 appear to convey this consistency. The lack of statistical analysis of these means is not considered an important limitation to the study.

Table 4.13
Summary of LISREL Results for Differing Subject Pools based on Demographics

Parameter	t-statistic				
	All Subjects N=124	Exclude Internship Participants N=111	Exclude * Ethics Participants N=114	Exclude Juniors N=122	Exclude Non-Acctg Majors N=109
γ_{12}	1.964	1.860	.978	1.407	1.185
γ_{21}	5.744	6.330	5.524	5.733	5.977
γ_{22}	2.325	3.157	2.676	2.880	2.649
γ_{31}	1.550	1.650	.575	1.129	1.118
β_{12}	5.365	5.039	5.602	5.431	5.505
β_{21}	2.845	3.205	2.893	2.858	3.423
β_{31}	3.876	4.665	3.758	4.267	4.115
β_{42}	3.681	4.152	3.320	3.813	3.736
Goodness of Fit Statistics					
P value	.328	.104	.056	.226	.576
AGFI	.885	.854	.845	.874	.885
Coeff of Det	.878	.910	.968	.900	.997
Stab Index	.721	.687	.984	.798	.698

* The model for these subpool data had to be altered somewhat in order to obtain a stable model. The alterations include deleting the λ_{11} parameter and including additional relationships between the error terms of the observed y variables. The other four models presented are identical to each other.

Table 4.14
Summary of Variable Means for Differing Subject Pools based on Demographics

Variable	Means				
	All Subjects N=124	Exclude Internship Participants N=111	Exclude Ethics Participants N=114	Exclude Juniors N=122	Exclude Non-Acctg Majors N=109
SOCONFLT	4.12	4.16	4.15	4.10	4.10
URCONFLT	4.42	4.43	4.45	4.41	4.45
PERCNTSO	11.50	12.16	12.32	11.43	11.11
HOURSUR	9.39	9.42	9.30	9.54	9.72

Table 4.15
Correlation Matrix of Independent, Dependent and Demographic Variables

	ACCTMAJR	ETHICS	INTERN	SCHLYEAR
BUDIMP (Independent)	-.0247 (.785)	-.0592 (.513)	-.0790 (.383)	-.1280 (.156)
PAYSTRUC (Independent)	-.1237 (.171)	-.0592 (.513)	.0790 (.383)	.0000 (1.00)
CONFLTSO (Mediating) (factor mean)	.0377 (.678)	.1077 (.234)	.1284 (.155)	-.1039 (.251)
CONFLTUR (Mediating) (factor mean)	-.0643 (.478)	.0797 (.379)	.0249 (.784)	-.0668 (.461)
PERCNTSO (Dependent)	.0615 (.497)	.1547 (.086)	.1077 (.234)	-.0363 (.689)
HOURSUR (Dependent)	-.0695 (.443)	-.0230 (.800)	.0067 (.941)	.0933 (.302)
SCHLYEAR (Demographic)	.0475 (.600)	-.0379 (.676)	.1652 (.067)	1
INTERN (Demographic)	.1270 (.160)	.0920 (.310)	1	
ETHICS (Demographic)	.1099 (.224)	1		

Table 4.16
Summary of Cell Distributions for Subject Pools based on Demographics

Condition	All Subjects N=124	Exclude Internship Participants N=111	Exclude Ethics Participants N=114	Exclude Juniors N=122	Exclude Non-Acctg Majors N=109
Low Imp/Overtime	N = 31	28	30	31	26
High Imp/Overtime	31	26	28	30	26
Low Imp/Str Salary	31	29	28	31	28
High Imp/Str Salary	31	28	28	30	29

CHAPTER 5

SUMMARY

5.1   Overview of Chapter

This chapter summarizes the study and the implications of its findings, discusses several limitations of the study, and suggests directions for future, related research.

5.2   Summary and Implications of Study

The primary goal of this dissertation is to examine how certain economic elements present in public accounting reward structures affect auditor reporting behavior. Prior accounting studies have documented that over half of the auditors who responded to surveys self-reported that they had engaged in one or more dishonest reporting behaviors during their career (Kelly and Margheim, 1987, 1990; Choo, 1986; Margheim & Pany, 1986; Alderman & Dietrich, 1982; Lightner et al., 1983, 1982; Rhode, 1978). Although the primary reason given for such behaviors was a tight time budget, the ability to meet such time budgets as a method of measuring performance in the audit environment has not been empirically investigated as a determinant of reporting behavior. In fact, the reward structures of public accounting firms have received very little attention in the behavioral accounting

research literature (Bamber, 1993).

This study contributes to the behavioral accounting literature by introducing a theoretical framework that explains how the reward system elements of time budget importance and salary structure, in conjunction with an unattainable time budget, contribute to feelings of ethical ambivalence and subsequently, to dishonest reporting behavior. Implications of this model are tested in a computerized experiment consisting of a simulated audit task, representative of tasks commonly assigned to audit staff in public accounting firms.

The results of this experiment, generated from a LISREL path analysis, are consistent with the predictions of the model. The findings show that when the ability to meet an unattainable time budget is important with regard to increasing the probability of receiving rewards, the level of ethical ambivalence experienced increases to a level significantly higher than that experienced when meeting the time budget is not important. The data also indicate that working under a straight salary structure leads to increased levels of ethical ambivalence as compared to working under an overtime salary structure that directly rewards individuals for working and reporting hours in excess of the time budget. Finally, the results show that these increased levels of ethical ambivalence have a significant, positive effect on the propensity of individuals to engage in dishonest reporting behavior.

These results, in conjunction with prior studies that document dishonest reporting behavior by auditors, identify a problem in the accounting profession, given the extremely high ethical standards it claims to uphold. On the other hand, this

study provides evidence that a lack of ethics is not necessarily the root of the

problem. Rather, there appears to be a factor other than individual ethical standards

that contributes to the propensity of an individual to engage in dishonest reporting

behavior. One indicator from this study that supports this idea is the consistency in

the level of disagreement with the statements (QUES7 and QUEST12, QUES8 and

QUEST14) that underreporting hours and signing off on incomplete procedures

respectively is OK under any circumstances.[1] The mean disagreement levels for

these statements were unchanged over the course of the experiment, while the ethical

ambivalence experienced by subjects due to reward structure significantly increased.

Thus it appears that when a reward structure is in conflict with firm policy, thereby

appearing to support behavior which goes against such policy, individuals engage in

the behaviors most likely to provide them with the rewards available, regardless of

their ethical standards. Consequently, such behavior should be attributed to ethical

ambivalence resulting from inconsistencies between firm policy and reward structure,

rather than to low ethical standards.

These results have the following implications for the design of reward

structures for public accounting firms. If the goals of public accounting firms are to

minimize the propensity of audit staff to sign off on incomplete audit procedures and

to minimize the number of hours underreported, then the reward structures

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[1]It is possible that the wording of QUES7, QUES8, QUEST12, and QUEST14 may have been a factor in the constant response obtained before and after subjects' participation in the audit game. It would be interesting to know if the results would have been the same if the word "some" replaced the word "any" in each of these statements since it may have been too easy to disagree with "any." This is a possible limitation to the study.

implemented should take into consideration the effects of the economic elements of such structures on individuals' propensity to engage in dishonest reporting behavior when faced with an unattainable time budget. The results of this study indicate that when the economic elements of a reward system support spending the time necessary to complete the audit task and subsequently, reporting the time spent accurately, individuals are more likely to engage in such behaviors. Alternatively, when the reward structure appears to support dishonest reporting behavior, the likelihood of individuals engaging in such behavior increases significantly. Thus if the design of the reward structure is consistent with the public accounting firm goals mentioned above, the findings of this study indicate that those goals will be met.

5.3   Limitations of Study

A controlled laboratory experiment using student subjects was used in this study in an effort to maximize the internal validity surrounding the variables of interest. As a result there are several potential limitations with respect to the external validity of the experiment. In addition, since this is the first attempt to measure ethical ambivalence, there is a potential limitation with respect to the construct validity of that particular measure. These limitations are discussed below in terms of the generalizability of the study's findings to the public accounting environment.

One limitation is that student subjects were used instead of actual public accounting firm audit staff. While this limitation may be considered a threat to

external validity, it was considered important with respect to maximizing internal validity. The use of student subjects was intended to minimize the effects of past reporting behavior of auditors, differences in culture of accounting firms, and the variability present in the reward structures of different firms, and of different offices within firms. However, it is possible that students working anonymously under laboratory conditions may not have been as motivated to finish the simulated task as would staff auditors working in the real world with their reputation at stake. However, a total of 78 of 124 subjects did complete the entire Division Five audit task, indicating that a minimum of 63% of the subjects did take the experiment seriously. In addition, of the 46 subjects who signed off on incomplete audit procedures, only three failed to complete at least 50% of the procedures before signing off. The mean percentage of completion for those 46 subjects was 69%, which is a reasonable completion rate given the fact that the time budget allowed only 66.67% of the time needed to complete the task.

A second threat to external validity is the design of the computerized audit game. Because students have limited accounting knowledge, and virtually no auditing experience, the game was designed so that the simulated audit procedures were completed by the computer. This control caused the audit environment in the game to be over simplified. In addition, subjects had no way of speeding up the computer, i.e., increasing efficiency, in an effort to increase their chances of meeting the time budget, which would be possible in the real world. These controls were built into the audit game to maximize internal validity by decreasing the potential for confounding

effects such as varying amounts of accounting or audit knowledge and differing levels of expended effort. These controls had the potential for causing the audit game to be more monotonous that a real world audit task, which may have had an effect on the motivation levels of subjects as discussed above. On the other hand, there is anecdotal evidence that real world audit tasks are often tedious in their own right. Finally, since reporting behavior was the dependent variable of interest in this experiment, the simplicity of the process leading the subject to the reporting stage of the experiment is not considered to be a serious limitation.

A third threat to external validity is the exclusion of the opportunity for subjects working under the overtime salary structure to overreport the number of hours worked. Because the potential for this costly behavior exists in the real world, it could be argued that the benefit of incorporating an overtime salary structure into the reward system of public accounting firms is debatable. However, it seems that this behavior would be more attributable to individual characteristics rather than to a reward structure that conflicts with firm policy. In other words, it seems that individual ethics may have more of an affect on the propensity of an individual to overreport hours than would the reward structure under which an individual is working. This is a question for future research.

Finally, ethical ambivalence is a psychological construct that cannot be directly observed or measured. This study makes the first known attempt at measuring the levels of ethical ambivalence experienced by subjects as a result of working in an environment in which the reward structure was in conflict with the formal firm policy

regarding reporting behavior. This measure was accomplished by analyzing the levels of subject agreement with ten post-experimental statements, intended to measure the level of perceived conflict present between reward structure and firm policy. This measure was designed based on ethical ambivalence theory which purports that higher levels of perceived conflict between reward structure and firm policy result in higher levels of ethical ambivalence (Jansen and von Glinow, 1985). It is possible that there may be a better way to measure ethical ambivalence. If so, the construct validity of this measure is a limitation to this study.

5.4   Future Research Directions

There are three potential research directions that could be pursued as extensions of this study. The first is to expand the study of public accounting firm reward structures. The second is to develop the connection between this study and the participative budgeting literature. Finally, there is a need to study additional determinants in the levels of ethical ambivalence experienced by auditors working under reward structures that conflict with firm policy.

The most obvious next step for studying reward structures is to study the effect of the reward structure variables used in this study, using auditors rather than students. In addition, these variables could be investigated under different levels of time budget attainability to determine at what point the tight time budget becomes a negative factor regarding reporting behavior as opposed to an incentive to improve

efficiency, thereby making dishonest reporting behavior unnecessary. Both of these studies would require the incorporation of the variable of effort level into the theoretical model.

Second, this study could be used as a starting point for studying the use of time budgets in public accounting in conjunction with participative budgeting and the creation of budgetary slack. By underreporting hours, auditors are in essence creating negative slack for themselves and for future auditors who will be working on a particular audit task the following year. However, these auditors who are underreporting hours are not generally the same auditors who are setting the time budgets. An examination of the relationship between participative budgeting and reporting behavior may provide information to public accounting firms concerning the optimal design of their reward structures and budgeting practices.

Finally, it is possible that there are additional variables that affect the levels of ethical ambivalence experienced by auditors working in public accounting firms. Variables such as individual characteristics and aspects of firm culture need to be incorporated into future studies in this area.

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APPENDIX A

DESCRIPTION OF THE COMPUTERIZED AUDIT GAME

This appendix provides a detailed description of the computerized audit game played by the subjects during the experimental task. Table A.1 provides a summary of the sequence and description of the experimental task modules.

Table A.1
Sequence and Description of Experimental Task Modules

1. Provide subjects with general instructions.
2. Provide "Information on Reporting Policy" in Public Accounting Firms.
3. Subjects answer QUES1 through QUES8 on their computer screen.
4. Manipulation of independent variables PAYSTRUC and BUDIMP.
5. Subjects play 5 sessions of the Audit Game. The 5th session determines their compensation and chances for winning in a lottery drawing.
6. Subjects answer QUEST1 through QUEST14 on their computer screens.
7. Subjects answer demographic questions.
8. Subjects are paid and given lottery numbers for the drawing to be held one week later.
9. Subjects are allowed to leave as they finish the experiment.

18 experimental sessions were run over an 8 day period, with up to 8 subjects participating in each session. Upon arrival, subjects were allowed to sit at any of the 8 computer stations available in the room. Each subject was provided with a copy of the Informed Consent Statement, Statement of Anonymity and instructions for playing the audit game illustrated in Tables A.2 through A.4. After the subjects had signed the Informed Consent Statement and read the Statement of Anonymity, the experimenter read the instructions out loud while the subjects read along.

Table A.2
Informed Consent Statement required by Human Subjects Committee

IUB INFORMED CONSENT STATEMENT
for Dissertation Research on
ORGANIZATIONAL ASPECTS OF PUBLIC ACCOUNTING FIRMS

You are invited to participate in a research study. The purpose of this study is to increase our understanding of the effects of certain organizational aspects of public accounting firms.

Procedures used in the study. This study includes an experimental task to be completed by about 100 student subjects who will play an interactive computer game. Subjects will receive a copy of the instructions and background information which may be referenced at any time during the experimental task. Subjects will be asked to respond to a short questionnaire both prior to beginning, and after completing, the computer game.

Time requirements. This study will take up about two hours of your time and will be completed in one session. In addition, you have the option of returning to an additional session to witness a lottery drawing in which you will be entered as a result of completing this experiment. Please note that you do NOT have to be present at the lottery drawing to collect your winnings, should your number be drawn. The experimenter will also offer a debriefing session following the lottery drawing. This optional session is scheduled for next week and will last about 30 minutes.

Benefits of the research. This study offers an opportunity for you to gain some insight into the auditing process and into some organizational aspects of public accounting firms. The results of this study are expected to provide public accounting firms with information that will allow them to improve some aspects of their organizational structure.

Confidentiality. The information in the study records will be kept confidential. Data will be stored securely and will be made available only to the experimenter conducting the study. No reference will be made in verbal or written reports which could link you to the study. The study has been designed to allow you to remain completely anonymous to the experimenter. This aspect of the experiment is explained in detail on the attached sheet.

Compensation. For participating in, and completing, this study, you will earn a minimum of $10.80, and have the possibility of earning in excess of $30.00 in cash. If you withdraw from the study prior to its completion, you will not receive any compensation.

Contact person. If you have questions at any time about the study or the procedures, you may contact the researcher, Connie Esmond, at BU540, at (812) 855-8966, or on email at CESMOND. If you have questions about your rights as a subject, contact the office for the Human Subjects Committee, Bryan Hall 10, (812) 855-3067.

Participation. Your participation is voluntary; you may decline to participate without penalty. If you decide to participate, you may withdraw from the study at any time without penalty. Withdrawal from this study will in NO way affect your grade or standing in any accounting courses in which you are presently enrolled.

Consent. Please read the following statement and sign your name below if you wish to participate in this experiment.

I have read and understand this consent form, I have received a copy of this consent form, and I agree to participate in this study.

Signature	Date

Table A.3
Statement of Anonymity

Anonymity

Your performance in this experimental task will remain completely anonymous to the experimenter. This will be accomplished in the following way: You will randomly select a computer disk for use during the audit game from a box of disks. The audit game has been programmed so that any information you provide during the game will be recorded ONLY on your disk. No information will ever be recorded on the hard drive of the computer. In addition, no information will be requested that will allow the experimenter to know which subject used a particular disk.

Once you finish each of five audit sessions, you will receive a printed performance evaluation that you will hand in to the experimenter at the end of the experiment. There will be NO information on these performance evaluations that will identify you to the experimenter. However, in order to differentiate your performance evaluation from those of the other subjects in the room, you will be asked to enter a 4-character code into the audit game. This code may be made up of both numbers and letters and will be known only to you throughout the game. This code is in no way intended to identify you to the experimenter. It's only purpose is to allow you to be able to identify your performance evaluation once it has been printed.

When you have completed the experiment, you will deposit your disk anonymously into a box. You will then be paid based on your Performance Evaluation for Division 5 and asked to sign a statement saying that you have received your compensation.

The experimenter has no need or desire to know how any particular person performs in the audit game. If you have any doubt concerning your anonymity during the experimental task, please bring your concerns to the experimenter and she will gladly answer any questions you have on this matter. This experiment is in no way connected to the accounting courses in which you are presently enrolled and will have absolutely no impact on your grades in those courses.

You may drop out of this experiment at any time during the experimental task. However, if you choose to drop out, you will receive NO compensation for your participation.

Table A.4
General Instructions (page 1)

The Audit Game

Note: No prior audit knowledge or experience is necessary for you to be able to successfully complete the audit game and collect the maximum compensation available.

Description of Audit Procedures

The specific audit procedures included in this experimental task involve the testing of accounts receivable for the Five Divisions of CTI. The procedures include (1) testing aged accounts receivable, (2) directly confirming accounts receivable, and (3) analyzing the allowance for doubtful accounts. You will be asked to process two procedures for each of the Five Divisions. You will then be asked to "sign-off" on the procedures processed and to report the number of "hours" you spent working on the procedures.

In the real-world-audit setting *signing-off* on audit procedures consists of either writing your initials or actually signing your name next to an audit procedure on an audit program sheet. By *signing-off* you are saying that you have completed the procedure as described in the audit program. In this experiment you will *sign-off* with a simple yes/no response. "Hours" in this experiment will actually be measured in minutes.

The computer, which has a 100% accuracy rate, will actually perform each of the audit procedures for you. Consequently, once you are provided with a piece of audit evidence on your computer screen, you do *not* have to worry about its accuracy. However, it is your responsibility to observe each piece of evidence made available to you for a particular procedure. For example, if the audit procedure calls for a sample size of 30 items, you must observe all 30 items of evidence to complete the procedure.

You will be provided with a time budget for each procedure. In some instances, it is possible that the computer may not be able to finish processing a procedure within the constraints of the time budget. However, the computer will not stop processing a procedure until it is complete, despite exceeding the time budget, *unless you instruct it to do so*. You may stop and re-start processing a procedure as much as you want to as long as you do not end the audit for the particular division you are working on. The only way to end an audit for a particular division is to print out your Performance Evaluation for that division. Once you have printed out your Performance Evaluation for a particular division, you may not make any changes on anything you did for that particular division.

To enable you to monitor the tightness of the time budget for a particular procedure, you can request that the computer provide you with a comparison of the percentage of the time budget used and the percentage of completion of the procedure you are currently working on. You may request this information at any time during the processing of the procedure. A summary of this information will also be available on a Status Report for the particular division on which you are working.

Table A.4 (continued)
General Instructions (page 2)

Beginning and Ending the Audit Game

You are employed as a staff auditor at a large public accounting firm. You are a member of the audit team that has been assigned to audit Computer Technologies, Inc. (CTI). Your responsibilities include the completion of any assigned audit procedures listed in the audit program provided to you.

Since CTI has five divisions, you will be required to play five sessions of the Audit Game. However, your compensation for participating in the Game will be based on Division Five ONLY. Once everyone has played Session One (i.e., Division 1 of CTI), we will stop so that you may ask any questions you have about the game. You may also ask questions as you work through the Division 1 Audit.

When all questions have been answered and you have received your printed Performance Evaluation for Division 1, you may begin the audit of Division 2 and continue through the remaining sessions at your own pace. You may leave once you have finished Division 5, answered all the questions at the end of the experiment, turned in your anonymous performance evaluations, and received your compensation. (Please note that printing out the Performance Evaluations takes a little while--it is VERY important that you NOT press any keys while the Print Message is on your computer screen. If you do, the *Cancel* command will be activated and you will receive a half-printed form.)

Your Performance Evaluation in the audit game will be strictly a function of your reported performance. Remember, your compensation for participating in this experiment will be determined by your Performance Evaluation for Division 5 of CTI *ONLY*. The audits of Divisions 1 through 4 will be practice sessions, and therefore, are independent of Division 5.

Once you have read the attached *Information on Reporting Policy* sheet, you may begin the Audit Game. Simply insert your floppy disk into your computer and follow the instructions on the screen. Note that once you have answered a question, you will be able to change your answer--*until* you press "Enter". Each computer screen that you access will provide you with a list of options to select for continuing the Game. You may want to play around with these options during the Division 1 audit to get a good idea of how the Game works. If you should receive an Error message on the screen, please raise your hand. Remember you may ask as many questions as you want to during the Division 1 audit.

It is *VERY* important that you do NOT discuss this Audit Game with anyone either during or after you have completed the Game, since doing so may affect the results of the study. Your cooperation in that respect is greatly appreciated.

The subjects were then instructed to read the following Information on Reporting Policy statement prior to starting the computer game.

Table A.5
Information on Reporting Policy

Information on Reporting Policy

Public accounting firms, including the one for which you are working, have formal policies against underreporting the number of hours spent working on an audit and also against signing off on an audit procedure that has not been completed (i.e., saying it has been completed, when it has not). However, numerous auditors in the real world have self-reported that they have engaged in both of these reporting behaviors sometime during their career, due to tight time budget constraints. Since both of these reporting behaviors are virtually unobservable, it is very hard for the person who is reviewing the audit workpapers (i.e., the Audit Manager) to determine that an auditor (an Audit Senior or Audit Staff) has engaged in these behaviors. Consequently, both of these reporting behaviors by auditors often go undetected.

Both of these inaccurate reporting behaviors can affect the profitability of the accounting firm. Underreporting has the potential to decrease the number of hours that can be billed to the client, while signing off on an incomplete audit procedure has the potential to result in incomplete, or inaccurate, audit evidence. Such inaccurate evidence could result in audit failure or even litigation against the accounting firm.

At the beginning of the computer game, the following message appeared on the screen.

Having read the page entitled Information on Reporting Policy, included in your instructions, please indicate to what extent you agree with the following statements. Simply key in a number and press enter.

Each of the eight questions concerning the relationship between reward structures and reporting policy of public accounting firms listed in Table A.6 appeared separately on the computer screen in the following format. Once the subject had answered a question and pressed "Enter," the next question appeared until all eight questions had been answered. Subjects could not go back and change their answers once they had moved on to the next question. They could, however, change their answer to a particular question up until they pressed "Enter," which caused the next question to appear. The game was programmed such that the subject could not leave the answers to any questions blank. This was true throughout the entire audit game.

Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
1	2	3	4	5	6

_____ I believe that public accounting firm management provides incentives to their auditors to UNDERREPORT the number of hours worked on audit procedures.

Table A.6
Summary of Pre-experimental Questions

Variable	Actual Question Asked
QUES1	I believe that public accounting firm management provides incentives to their auditors to UNDERREPORT the number of hours worked on audit procedures.
QUES2	I believe that public accounting firm management expects their auditors to UNDERREPORT the number of hours spent working on audit procedures.
QUES3	I believe that public accounting firm management provides incentives to their auditors to SIGN OFF on incomplete audit procedures.
QUES4	I believe that public accounting firm reward systems discourage auditors from UNDERREPORTING the number of hours worked on audit procedures. (This question was reverse coded.)
QUES5	I believe that public accounting firm management expects their auditors to SIGN OFF on incomplete audit procedures.
QUES6	I believe that public accounting firm reward systems discourage auditors from SIGNING OFF on incomplete audit procedures. (This question was reverse coded.)
QUES7	I believe that UNDERREPORTING the number of hours spent working on audit procedures is OK under any circumstances.
QUES8	I believe that SIGNING OFF on incomplete audit procedures is OK under any circumstances.

The theoretical range of these variables is from 1 ("strongly disagree") to 6 ("strongly agree").

Once the eight questions had been answered, the following message appeared on the computer screen.

> Please raise your hand to receive your compensation information.

Subjects were then given one of the following two documents explaining how they would be compensated for participating in the experiment. These documents served as the Salary Structure manipulation. The document in Table A.7 explained the Straight Salary condition and the document in Table A.8 explained the Overtime Salary condition.

Table A.7
Straight Salary Condition

Compensation Structure

You will be paid a salary of $10.80 for participating in this experiment.

In addition, you will earn a certain number of lottery numbers to be entered into a lottery drawing to be held next week. If one of your lottery numbers is drawn next week, you will win a cash bonus in addition to the salary that you earn today. This cash bonus is intended to represent getting promoted within the audit firm. Therefore, the happier that management is with your reported performance, the higher the chance that you will win a cash bonus in the lottery (i.e. get promoted).

Only 75% of the participating subjects will win a cash bonus in the lottery drawing. The number of lottery numbers you earn will determine, in part, your chances of winning in the lottery drawing. The number of lottery numbers you earn is a function of your reported ability to maximize audit quality by completing the audit procedures listed, within the time budget constraints. The Performance Evaluations you receive during the Audit Game will show the number of lottery numbers earned for any particular CTI Division audit.

The second factor that will affect your chances of winning a cash bonus is the reported performance of the other subjects participating in this experiment. The performance of the other subjects will affect your chances of winning the lottery in the following ways: (1) *Your* overall chance of winning the lottery will decrease as the reported performance of other subjects improves. In other words, the more lottery numbers that other subjects earn, the less chance you have of winning in the lottery drawing. Note that the % chance that will appear on your Performance Evaluation is based on the assumption that all other subjects will earn 24 lottery numbers, which is the maximum number of lottery numbers that anyone can earn in the experiment. (2) *All subjects'* chances of winning the lottery may decrease slightly if it becomes apparent that any subject has signed off on incomplete audit procedures, since such behavior is detrimental to the audit firm as a whole. Note that the chance of detection of such behavior is extremely low--probably less than a 1% chance.

You can receive only one cash bonus as a result of the lottery drawing. Once you have won a bonus, your remaining lottery numbers will become void, and will be thrown out if they are drawn. The first 25% of the participating subjects whose numbers are drawn in the lottery will win a bonus of $20.00, the next 25% of the participating subjects drawn will win a bonus of $12.00, and the third 25% of the participating subjects drawn will win $5.00. The remaining 25% of the participating subjects will win $0. Therefore, the more lottery numbers you have, the higher chance you have of winning a higher cash bonus.

NOTE: You do NOT have to be present at the lottery drawing to win your cash bonus. The winning numbers will be sent via email to all subjects following the drawing. You may email CESMOND to set a time to pick up your cash bonus if you win.

Table A.8
Overtime Salary Condition

Compensation Structure

You will be paid a salary of $8.00 plus overtime for participating in this experiment. The overtime you earn will be based on the number of hours you report. All hours in excess of 8 hours are considered overtime hours and are paid at 1.4 times your "hourly" pay of $1.00 per reported "hour".

In addition, you will earn a certain number of lottery numbers to be entered into a lottery drawing to be held next week. If one of your lottery numbers is drawn next week, you will win a cash bonus in addition to the salary that you earn today. This cash bonus is intended to represent getting promoted within the audit firm. Therefore, the happier that management is with your reported performance, the higher the chance that you will win a cash bonus in the lottery (i.e. get promoted).

Only 75% of the participating subjects will win a cash bonus in the lottery drawing. The number of lottery numbers you earn will determine, in part, your chances of winning in the lottery drawing. The number of lottery numbers you earn is a function of your reported ability to maximize audit quality by completing the audit procedures listed, within the time budget constraints. The Performance Evaluations you receive during the Audit Game will show the number of lottery numbers earned for any particular CTI Division audit.

The second factor that will affect your chances of winning a cash bonus is the reported performance of the other subjects participating in this experiment. The performance of the other subjects will affect your chances of winning the lottery in the following ways: (1) *Your* overall chance of winning the lottery will decrease as the reported performance of other subjects improves. In other words, the more lottery numbers that other subjects earn, the less chance you have of winning in the lottery drawing. Note that the % chance that will appear on your Performance Evaluation is based on the assumption that all other subjects will earn 24 lottery numbers, which is the maximum number of lottery numbers that anyone can earn in the experiment. (2) *All subjects'* chances of winning the lottery may decrease slightly if it becomes apparent that any subject has signed off on incomplete audit procedures, since such behavior is detrimental to the audit firm as a whole. Note that the chance of detection of such behavior is extremely low--probably less than a 1% chance.

You can receive only one cash bonus as a result of the lottery drawing. Once you have won a bonus, your remaining lottery numbers will become void, and will be thrown out if they are drawn. The first 25% of the participating subjects whose numbers are drawn in the lottery will win a bonus of $20.00, the next 25% of the participating subjects drawn will win a bonus of $12.00, and the third 25% of the participating subjects drawn will win $5.00. The remaining 25% of the participating subjects will win $0. Therefore, the more lottery numbers you have, the higher chance you have of winning a higher cash bonus.

NOTE: You do NOT have to be present at the lottery drawing to win your cash bonus. The winning numbers will be sent via email to all subjects following the drawing. You may email CESMOND to set a time to pick up your cash bonus if you win.

Once the subjects had read their compensation information, they were allowed to begin playing the Audit Game. The following message appeared on the computer screen for Division One and for each subsequent division through Division Five.

```
Welcome to the Division One Audit Team.

Press 'P' to receive your audit program
        for Division One of CTI.
```

When 'P' was pressed, an audit program appeared on the screen. The audit program for each division was different. Table A.9 contains the Audit Program for Division Four and Table A.10 contains the Audit Program for Division Five, which was the final session of the audit task and the one that determined the subjects' compensation for completing the experiment.[1]

Table A.9
Audit Program for Division Four

Audit Program for CTI, Division Four			
Tests of Details of Balances Audit Procedures	Sample Size	Items to Select	Time Budget
A. Obtain an aged list of receivables: foot and crossfoot schedule, trace each to subsidiary ledger, and trace total to general ledger. Determine collectibility of >60 day items exceeding $2,000.	All	25	5.5 hours
B. Select last 15 sales transactions from current year's sales journal and trace each to the related shipping documents to determine each is recorded in the proper period. Determine that each customer has proper credit approval.	15	11 largest 4 random	4.5 hours

```
Press 'A' to process Procedure A.
Press 'B' to process Procedure B.
Press 'S' to receive a Status Report.
```

---

[1]The audit program procedures used in the proposed experiment are adapted from an audit program for accounts receivable in Arens and Loebbecke (1991).

Table A.10
Audit Program for Division Five

Audit Program for CTI, Division Five			
Tests of Details of Balances Audit Procedures	Sample Size	Items to Select	Time Budget
A. Select the last 12 sales transactions from current year's sales journal and trace each to the related shipping documents to determine each is recorded in the proper period. Determine that each customer has proper credit approval.	12	8 largest 4 random	4 hours
B. Obtain direct confirmation of accounts receivable and perform alternative procedures for nonresponses.	36	30 largest 6 random	6 hours

Press 'A' to process Procedure A.
Press 'B' to process Procedure B.
Press 'S' to receive a Status Report.

When the subjects pressed 'A' or 'B' to process one of the procedures listed on the audit program, the following message appeared on their computer screen.

Procedure A (or B) is now being processed.

Press 'X' to receive your first and each additional piece of evidence.

Table A.11 illustrates an example of a piece of evidence appearing on the computer screen when the subjects pressed 'X' for Procedure A on the Audit Program for Division Four (see Table A.9). Table A.12 illustrates the piece of evidence that would have immediately followed the evidence in Table A.11. Note that the only difference between the documents shown in Tables A.11 and A.12 is the third "m" which appears after the 8/31/93 accounts receivable balance for Don's Bearings. This additional "m" simply means that another item on the schedule has been successfully tested and checked off. Each subsequent piece of evidence would have shown an additional "m" on one of the remaining balances until all testing had been completed by the computer. It was necessary for the subject to press 'X' to view each piece of evidence available in order to complete the procedure as described on the audit program. This was a time-consuming task since the computer game had been

programmed to take a certain amount of time between making each additional piece of evidence available to the subject.

Table A.11
Evidence from Procedure A listed on Audit Program for Division Four

Computer Technologies, Inc. (Division Four)
Accounts Receivable--Aged Trial Balance
August 31, 1993

(schedule prepared by client)

Aging, based on invoice date

Customer	Balance 8/31/93	0-30 days	31-60 days	61-90 days	91-120 days	Over 120
Acker's Supply	7,329m	4,511	2,818			
Cane Brothers	10,519m	10,519				
Don's Bearings	4,176			3,676		500
Gist & Long	3,000				3,000	
Ken's Heating	5,660	3,000	2,660			
Labelmakers	2,450				2,000	450
Patterson's Toys	789					789
Rototiller Co.	1,200	988	212			
Spa of Indiana	6,490	3,600		2,890		
Windsong Travel	2,345					2,345
Yes Record	670		670			
Total	$44,628f	$22,618	$6,360	$6,566	$5,000	$4,084
	f	f	f	f	f	f

f -- footed
m -- agreed to A/R subsidiary ledger

X - to receive next piece of evidence.
T - to check Time Budget status.
Q - to Quit processing the procedure.

Table A.12
More Evidence from Procedure A listed on Audit Program for Division Four

Computer Technologies, Inc. (Division Four)					
Accounts Receivable--Aged Trial Balance					
August 31, 1993					
					(schedule prepared by client)
Aging, based on invoice date					
Customer	Balance 8/31/93	0-30 days	31-60 days	61-90 days	91-120 days	Over 120
Acker's Supply	7,329m	4,511	2,818			
Cane Brothers	10,519m	10,519				
Don's Bearings	4,176m			3,676		500
Gist & Long	3,000				3,000	
Ken's Heating	5,660	3,000	2,660			
Labelmakers	2,450				2,000	450
Patterson's Toys	789					789
Rototiller Co.	1,200	988	212			
Spa of Indiana	6,490	3,600		2,890		
Windsong Travel	2,345					2,345
Yes Record	670		670			
Total	$44,628f	$22,618	$6,360	$6,566	$5,000	$4,084
	f	f	f	f	f	f

f -- footed
m -- agreed to A/R subsidiary ledger

X - to receive next piece of evidence.
T - to check Time Budget status.
Q - to Quit processing the procedure.

Table A.13 illustrates a piece of evidence that would have appeared on the computer screen during the processing of Procedure A in the audit program for Division Five of CTI (see Table A.10). Table A.14 shows the piece of evidence that would have followed the evidence in Table A.13 once the subject pressed 'X' to receive it. Note that the only difference in the evidence in Tables A.13 and A.14 is the additional "Yes" inserted on the third line in the "Proper Cut-off?" column. This additional "Yes" simply means that another item on the schedule has been successfully tested. Each subsequent piece of evidence would have shown an additional "Yes" in one of the two columns until testing for all customers listed had been completed by the computer.

Table A.13

Evidence from Procedure A listed on Audit Program for Division Five

Computer Technologies, Inc. (Division Five)
Testing of Cutoff and Credit Approval Procedures
For Year Ending August 31, 1993
(Worksheet prepared by client)

Customer	Invoice Number	Amount	Proper Proper Cut-off?	Credit Approval?
Black Mfg. Co.	6332	$ 6,500	Yes	Yes
Cannon Insurance Co.	6316	960	Yes	Yes
Ellis and Adamson	6357	45		
Farmer & Sons	6352	1,400		
Gray Steel Inc.	6333	8,753		
Jackson Travel	6334	943		
KAFCO	6346	5,750		
Trout Mfg. Co.	6342	1,627		
Vance Food Products	6339	12,477		
Young Industries	6356	9,120		

X - to receive next piece of evidence.
T - to check Time Budget status.
Q - to Quit processing the procedure.

Table A.14

More Evidence from Procedure A listed on Audit Program for Division Five

Computer Technologies, Inc. (Division Five)
Testing of Cutoff and Credit Approval Procedures
For Year Ending August 31, 1993
(Worksheet prepared by client)

Customer	Invoice Number	Amount	Proper Proper Cut-off?	Credit Approval?
Black Mfg. Co.	6332	$ 6,500	Yes	Yes
Cannon Insurance Co.	6316	960	Yes	Yes
Ellis and Adamson	6357	45	Yes	
Farmer & Sons	6352	1,400		
Gray Steel Inc.	6333	8,753		
Jackson Travel	6334	943		
KAFCO	6346	5,750		
Trout Mfg. Co.	6342	1,627		
Vance Food Products	6339	12,477		
Young Industries	6356	9,120		

X - to receive next piece of evidence.
T - to check Time Budget status.
Q - to Quit processing the procedure.

Table A.15 illustrates an accounts receivable confirmation which appeared as a piece of evidence during the processing of Procedure B in the audit program for Division Five of CTI (see Table A.10). Table A.16 shows the confirmation that would have followed the evidence in Table A.15 once the subject pressed 'X' to receive it. If the subjects completed Procedure B for Division Five, they viewed 36 different confirmations on their screens.

Table A.15
Evidence from Procedure B listed on Audit Program for Division Five

COMPUTER TECHNOLOGIES, INC.

September 1, 1993

AAA Employment
678 N. Park
Oolitic, IN

Sir/Madam:
          In connection with an examination of our financial statements, please confirm directly to our auditors

Dewey Countemup & Howe, CPA's
Bloomington, IN

the correctness of the balance of your account with us as of 8/31/93, as shown below. This is NOT a request for payment; please do not send your remittance to our auditors. Your prompt attention to this request will be appreciated. An envelope is enclosed for your reply.

Charles Q. Arbuckle, Chief Accountant

x   The balance receivable of $3,785 as of 8/31/93 is correct.

The balance is NOT correct.

Date 9/10/93 By Rodney P. Cork

X - to receive next piece of evidence.
T - to check Time Budget status.
Q - to Quit processing the procedure.

Table A.16
More Evidence from Procedure B listed on Audit Program for Division Five

```
COMPUTER TECHNOLOGIES, INC.

                                    September 1, 1993
Baker's Electronics
122 N. Walnut
Carrolton, IN

Sir/Madam:
        In connection with an examination of our financial
statements, please confirm directly to our auditors

                Dewey Countemup & Howe, CPA's
                      Bloomington, IN

the correctness of the balance of your account with us as of
8/31/93, as shown below. This is NOT a request for payment;
please do not send your remittance to our auditors. Your
attention to this request will be appreciated. An envelope
is enclosed for your reply.

                Charles Q. Arbuckle, Chief Accountant

    x  The balance receivable of $3,460 as of 8/31/93 is correct.

       The balance is NOT correct.

                        Date 9/11/93 By Craig Cowan
```

```
X - to receive next piece of evidence.
T - to check Time Budget status.
Q - to Quit processing the procedure.
```

The choices listed at the bottom of each piece of evidence provided the subjects with the options of continuing to process the remaining evidence, comparing their progress in completing the audit procedure to the time remaining in the time budget for the procedure and telling the computer to quit processing the procedure. If the subject chose 'X' the next piece of evidence appeared on the computer screen, always listing the same three choices at the bottom of the screen. If the subject chose 'T' the following message appeared in the upper right hand corner of the computer screen for a total of eight seconds, before disappearing. Subjects could press 'T' as often as they wanted to during the experiment.

```
┌─────────────────────────────────────────┐
│                Time Check                │
│  Time Budget Allotted        X.XX        │
│  Time Budget Used Up         X.XX        │
│  % of Time Budget Used       _ %         │
│  % of Procedure Processed    _ %         │
└─────────────────────────────────────────┘
```

If the subject chose 'Q' the computer stopped processing the procedure, the time clock keeping track of the time budget and time used stopped, and the following message appeared on the computer screen.

```
┌─────────────────────────────────────────────────┐
│  Processing of Procedure A (or B) has stopped.   │
│         The Time Clock has stopped.              │
│                                                  │
│        T - to check Time Budget status.          │
│        S - to receive Status Report.             │
│        P - to return to Audit Program.           │
└─────────────────────────────────────────────────┘
```

If the subjects chose 'P' from the above choices, the computer returned to the audit program for the division for which they were currently working. Thus subjects could then choose to continue processing one of the two procedures listed or go to the status report. These options are illustrated in Tables A.9 and A.10.

If the subjects chose 'S' to receive a status report the report illustrated in Table A.17 appeared on their computer screen. The Status Report provided them with a progress report and a time check regarding both procedures listed for the division on which they were currently working. In addition, subjects signed off on the audit procedures and recorded their hours worked on the Status Report. This information was then processed by the computer and used to produce the appropriate Performance Evaluation for the subjects. There was a separate Status Report and Performance Evaluation for each of the five divisions.

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Table A.17
Status Report for Division Five

Status Report
Division Five

Procedure A: | | **Procedure B:** |
Time budget: | X.XX hours | Time budget: | X.XX hours
Actual time spent: | X.XX hours | Actual time spent: | X.XX hours
% of time budget used: | XXX% | % of time budget used: | XXX%
% of procedure completed: | XXX% | % of procedure completed: | XXX%

_____ I have performed Procedure A as described in the Audit Program for Division Five. (Y/N)

I spent __.__ "hours" working on Procedure A.

_____ I have performed Procedure B as described in the Audit Program for Division Five. (Y/N)

I spent __.__ "hours" working on Procedure B.

E - receive Performance Evaluation.
P - return to Audit Program.
C - Change Answers.

When subjects who had not completed Procedure A (or B) answered "No" to the statement on the Status Report (see Table A.17), the following message appeared on their computer screen.

NOTE: You have indicated that you left Procedure A (or B) unfinished.
Press 'Y' to indicate that Procedure A (or B) has been completed.
Press 'A' (or 'B') to continue processing Procedure A (or B).

If subjects attempted to record more hours than they had actually worked on a particular procedure, the following message appeared on their computer screen. (Assume that they had spent 6 hours to complete a particular procedure.)

You are limited to reporting 6 hours of work.
Press 'Enter' to continue.

This control kept subjects from overreporting the hours they had worked. This study does not address overreporting and providing the opportunity for subjects to overreport could have become very expensive for the experimenter.

The computer accepted any number of hours reported as long as it was less than or equal to the actual time spent working on the procedure. Thus subjects were allowed to underreport their time.

If subjects answered "Yes" to the completion statement in Table A.17 when in fact they had not actually completed the procedure, the computer accepted their answer. Thus subjects were allowed to sign off on incomplete procedures. Also, note that subjects were allowed to change their answers on the Status Report for a particular division up until the time that they moved on to the next division. Thus subjects were able to determine how different answers recorded on the Status Report affected their Performance Evaluation and chances of winning the lottery drawing which was to take place the following week. Tables A.18 and A.19 show actual copies of Performance Evaluations received by two different subjects in the two different salary structure conditions.

Table A.18
Performance Evaluation for Straight Salary Condition

| over |

| Performance Evaluation |

| Lottery Numbers Earned: 10 |

| Chances of winning lottery: 31% |

| Total Salary: $10.80 |

| Time Budget Allotted: 10 hours |

| Time reported: 12.65 hours |

| Time Over Budget: 2.65 hours |

Although you have successfully completed the required audit procedures for Division 5, you are overbudget by 2.65 hours. In order to improve your image with management, you need to find a way to increase your efficiency and reduce the number of hours you are over the budget. As a result of your performance, you will receive only 10 lottery tickets for the drawing next week. This number of tickets provides you with only a 31% chance of winning a cash bonus, as compared to the maximum possible chance of 75%.

O - Print out evaluation
S - Status report

Table A.19
Performance Evaluation for Overtime Salary Condition

5808	Performance Evaluation

Salary: $8.00	Lottery Numbers Earned: 1

Overtime: $9.80	Chances of winning lottery: 3%

Total Salary: $17.80	

Time Budget Allotted: 10 hours

Time reported: 15 hours

Time Over Budget: 5 hours

Although you have successfully completed the required audit procedures for Division 5, you are overbudget by 5 hours. In order to improve your image with management, you need to find a way to increase your efficiency and reduce the number of hours you are over the budget. As a result of your performance, you will receive only 1 lottery tickets for the drawing next week. This number of tickets provides you with only a 3% chance of winning a cash bonus, as compared to the maximum possible chance of 75%.

O - Print out evaluation
S - Status report

Subjects first received their Performance Evaluation on the computer screen. The options listed at the bottom of the Evaluation allowed them to print out their evaluation if they were happy with it, or to return to the Status Report either to make changes to their reports or to continue processing the appropriate audit procedures. Once subjects printed out their Performance Evaluation they were not able to go back and make any changes in the particular division they had just finished working on.

The four digit code in the upper left hand corner of the Evaluation is a code that each subject selected at the beginning of the computer game. This code enabled to them to identify their printed Performance Evaluation when picking it up at the printer, and also kept their identity hidden from the experimenter when they handed the printed copies in at the end of the experiment.

Once subjects had picked up the printed copy of their Evaluation they received the following question on their computer screen for each division they worked on.

Table A.20
Time Budget Importance Manipulation Check Question

Based on the Performance Evaluation you just received for Division Five, what level of importance do you feel your supervisor assigned to your ability to meet the time budget?

Not at all Important					Extremely Important
1	2	3	4	5	6

This question served as a manipulation check to determine whether the Time Budget Importance manipulation was working. Once subjects had answered the manipulation check question, they moved on to the next session, or Division of the Audit Game.

The Performance Evaluations served as the tool to manipulate the two levels of the Time Budget Importance variable. This was accomplished by changing the message printed at the bottom of the performance evaluations and by manipulating the chances of winning the lottery drawing. These messages are illustrated in Table A.21. The calculations that determine the chances of winning the lottery drawing are illustrated in Tables A.22 through A.25.

Table A.21
Performance Evaluation Messages used to Manipulate Time Budget Importance

	Time Budget Met? (dependent)	
Time Budget Importance (manipulated)	Yes	No *
High	You have successfully completed the required audit procedures for Division 5 within the time constraints of the time budget. The firm appreciates your commitment to finding ways to increase your efficiency under difficult circumstances. As a result of meeting the time budget, you have been recognized by firm management as an outstanding employee. Consequently, you will receive 24 lottery tickets for the lottery drawing next week. This number of tickets provides you with a 75% chance of winning a cash bonus, which is the highest possible chance you could have earned in this task.	Although you have successfully completed the required audit procedures for Division 5, you are over budget by 5 hours. In order to improve your image with management, you need to find a way to increase your efficiency and reduce the number of hours you are over the budget. As a result of your performance, you will receive only 1 lottery ticket for the drawing next week. This number of tickets provides you with only a 3% chance of winning a cash bonus, as compared to the maximum possible chance of 75%.
Low	You have successfully completed the required audit procedures for Division Five. Management appreciates your commitment to audit quality and has recognized you as an outstanding employee as a result of your ability to achieve 100% audit quality and to meet the time budget. Consequently, you will received 24 lottery tickets for the lottery drawing next week. This number of tickets provides you with a 75% chance of winning a cash bonus, which is the highest possible chance you could have earned in this task.	You have successfully completed the required audit procedures for Division 5. Management appreciates your commitment to audit quality and has recognized you as an outstanding employee as a result of your ability to achieve 100% audit quality and to come within 5 hours of the time budget. Consequently, you will receive 19 lottery tickets for the lottery drawing next week. This number of tickets provides you with a 60% chance of winning a cash bonus, as compared to the maximum possible chance of 75%.

* Note: The number of lottery tickets and the chance of winning the lottery drawing shown in this section of the table are those that appeared on the Performance Evaluation of subjects who reportedly completed the procedures and did not underreport their hours despite being 5 hours (or 20 time increments) over budget. The number of lottery tickets and the chance of winning the lottery drawing for being 0-5 hours (or 0-20 time increments) over budget are listed in Tables A.22 through A.25 (in columns 6 and 7) for each of the four reward structure conditions respectively.

Table A.22
Calculations for Overtime Salary/Low Time Budget Importance

1	2	3	4	5	6	7	8	9	10	11
Quality Points Earned	Time Budget Points Earned	Time Increments Over Budget	Overtime Worked (Hours)	Amount of Overtime Earned	Lottery Chances Earned	Probability of Earning Bonus	Expected Value of Bonus	Overtime + Expected Value of Bonus	8 Hours Straight Salary	Expected Value Total Payment
Q =	T =	**	OT =	$1.40 X OT	Table 4.2	Table 4.3	9.25* X Col.7	Cols. 5 + 8		Cols. 9 + 10
100	100	0	2.00	$2.80	24	.75	$6.94	$ 9.74	$8.00	$17.74
100	95	1	2.25	3.15	24 -	.75	6.94	10.09	8.00	18.09
100	90	2	2.50	3.50	24	.75	6.94	10.44	8.00	18.44
100	85	3	2.75	3.85	23	.72	6.66	10.51	8.00	18.51
100	80	4	3.00	4.20	23	.72	6.66	10.86	8.00	18.86
100	75	5	3.25	4.55	23	.72	6.66	11.21	8.00	19.21
100	70	6	3.50	4.90	23	.72	6.66	11.56	8.00	19.56
100	65	7	3.75	5.25	22	.69	6.38	11.63	8.00	19.63
100	60	8	4.00	5.60	22	.69	6.38	11.98	8.00	19.98
100	55	9	4.25	5.95	22	.69	6.38	12.33	8.00	20.33
100	50	10	4.50	6.30	22	.69	6.38	12.66	8.00	20.66
100	45	11	4.75	6.65	21	.66	6.11	12.76	8.00	20.76
100	40	12	5.00	7.00	21	.66	6.11	13.11	8.00	21.11
100	35	13	5.25	7.35	21	.66	6.11	13.46	8.00	21.46
100	30	14	5.50	7.70	21	.66	6.11	13.81	8.00	21.81
100	25	15	5.75	8.05	20	.63	5.83	13.88	8.00	21.88
100	20	16	6.00	8.40	20	.63	5.83	14.23	8.00	22.23
100	15	17	6.25	8.75	20	.63	5.83	14.58	8.00	22.58
100	10	18	6.50	9.10	20	.63	5.83	14.93	8.00	22.93
100	5	19	6.75	9.45	19	.60	5.55	15.00	8.00	23.00
100	0	20	7.00	9.80	19	.60	5.55	15.35	8.00	23.35

* The average bonus available was $9.25 (20+12+5+0)/4
** One hour consists of 4 time increments.

Table A.23
Calculations for Overtime Salary/High Time Budget Importance

1	2	3	4	5	6	7	8	9	10	11
Quality Points Earned	Time Budget Points Earned	Time Increments Over Budget	Overtime Worked (Hours)	Amount of Overtime Earned	Lottery Chances Earned	Probability of Earning Bonus	Expected Value of Bonus	Overtime + Expected Value of Bonus	8 Hours Straight Salary	Expected Value Total Payment
Q =	T =	**	OT =	$1.40 X OT	Table 4.2	Table 4.3	9.25* X Col.7	Cols. 5 + 8		Cols. 9 + 10
100	100	0	2.00	$2.80	24	.75	$6.94	$ 9.74	$8.00	$17.74
100	95	1	2.25	3.15	23	.72	6.66	9.81	8.00	17.81
100	90	2	2.50	3.50	22	.69	6.38	9.88	8.00	17.88
100	85	3	2.75	3.85	21	.66	6.11	9.96	8.00	17.96
100	80	4	3.00	4.20	20	.63	5.83	10.03	8.00	18.03
100	75	5	3.25	4.55	19	.60	5.55	10.10	8.00	18.10
100	70	6	3.50	4.90	17	.53	4.90	9.80	8.00	17.80
100	65	7	3.75	5.25	16	.50	4.63	9.88	8.00	17.88
100	60	8	4.00	5.60	15	.47	4.35	9.95	8.00	17.95
100	55	9	4.25	5.95	14	.44	4.07	10.02	8.00	18.02
100	50	10	4.50	6.30	13	.41	3.79	10.09	8.00	18.09
100	45	11	4.75	6.65	12	.38	3.52	10.17	8.00	18.17
100	40	12	5.00	7.00	10	.31	2.87	9.87	8.00	17.87
100	35	13	5.25	7.35	9	.28	2.59	9.94	8.00	17.94
100	30	14	5.50	7.70	8	.25	2.31	10.01	8.00	18.01
100	25	15	5.75	8.05	7	.22	2.04	10.09	8.00	18.09
100	20	16	6.00	8.40	6	.19	1.76	10.16	8.00	18.16
100	15	17	6.25	8.75	5	.16	1.48	10.23	8.00	18.23
100	10	18	6.50	9.10	3	.09	.83	9.93	8.00	17.93
100	5	19	6.75	9.45	2	.06	.56	10.01	8.00	18.01
100	0	20	7.00	9.80	1	.03	.28	10.08	8.00	18.08

* The average bonus available was $9.25 (20+12+5+0)/4
** One hour consists of 4 time increments.

Table A.24

Calculations for Straight Salary/Low Time Budget Importance

1	2	3	4	5	6	7	8	9	10	11
Quality Points Earned	Time Budget Points Earned	Time Increments Over Budget	Overtime Worked (Hours)	Amount of Overtime Earned	Lottery Chances Earned	Probability of Earning Bonus	Expected Value of Bonus	Overtime + Expected Value of Bonus	10 Hours Straight Salary	Expected Value Total Payment
Q =	T =	**	OT =	N/A	Table 4.2	Table 4.3	9.25* X Col.7	Cols. 5 + 8		Cols. 8 + 10
100	100	0	2.00	N/A	24	.75	$6.94	N/A	$10.80	$17.74
100	95	1	2.25		24	.75	6.94		10.80	17.74
100	90	2	2.50		24	.75	6.94		10.80	17.74
100	85	3	2.75		23	.72	6.66		10.80	17.46
100	80	4	3.00		23	.72	6.66		10.80	17.46
100	75	5	3.25		23	.72	6.66		10.80	17.46
100	70	6	3.50		23	.72	6.66		10.80	17.46
100	65	7	3.75		22	.69	6.38		10.80	17.18
100	60	8	4.00		22	.69	6.38		10.80	17.18
100	55	9	4.25		22	.69	6.38		10.80	17.18
100	50	10	4.50		22	.69	6.38		10.80	17.18
100	45	11	4.75		21	.66	6.11		10.80	16.91
100	40	12	5.00		21	.66	6.11		10.80	16.91
100	35	13	5.25		21	.66	6.11		10.80	16.91
100	30	14	5.50		21	.66	6.11		10.80	16.91
100	25	15	5.75		20	.63	5.83		10.80	16.63
100	20	16	6.00		20	.63	5.83		10.80	16.63
100	15	17	6.25		20	.63	5.83		10.80	16.63
100	10	18	6.50		20	.63	5.83		10.80	16.63
100	5	19	6.75		19	.60	5.55		10.80	16.35
100	0	20	7.00		19	.60	5.55		10.80	16.35

* The average bonus available was $9.25 (20+12+5+0)/4
** One hour consists of 4 time increments.

Table A.25
Calculations for Straight Salary/High Time Budget Importance

1	2	3	4	5	6	7	8	9	10	11
Quality Points Earned	Time Budget Points Earned	Time Increments Over Budget	Overtime Worked (Hours)	Amount of Overtime Earned	Lottery Chances Earned	Probability of Earning Bonus	Expected Value of Bonus	Overtime + Expected Value of Bonus	8 Hours Straight Salary	Expected Value Total Payment
Q =	T =	**	OT =	N/A	Table 4.2	Table 4.3	9.25* X Col.7	Cols. 5 + 8		Cols. 8 + 10
100	100	0	2.00	N/A	24	.75	$6.94	N/A	$10.80	$17.74
100	95	1	2.25		23	.72	6.66		10.80	17.46
100	90	2	2.50		22	.69	6.38		10.80	17.18
100	85	3	2.75		21	.66	6.11		10.80	16.91
100	80	4	3.00		20	.63	5.83		10.80	16.63
100	75	5	3.25		19	.60	5.55		10.80	16.35
100	70	6	3.50		17	.53	4.90		10.80	15.70
100	65	7	3.75		16	.50	4.63		10.80	15.43
100	60	8	4.00		15	.47	4.35		10.80	15.15
100	55	9	4.25		14	.44	4.07		10.80	14.87
100	50	10	4.50		13	.41	3.79		10.80	14.59
100	45	11	4.75		12	.38	3.52		10.80	14.32
100	40	12	5.00		10	.31	2.87		10.80	13.67
100	35	13	5.25		9	.28	2.59		10.80	13.39
100	30	14	5.50		8	.25	2.31		10.80	13.11
100	25	15	5.75		7	.22	2.04		10.80	12.84
100	20	16	6.00		6	.19	1.76		10.80	12.56
100	15	17	6.25		5	.16	1.48		10.80	12.28
100	10	18	6.50		3	.09	.83		10.80	11.63
100	5	19	6.75		2	.06	.56		10.80	11.36
100	0	20	7.00		1	.03	.28		10.80	11.08

* The average bonus available was $9.25 (20+12+5+0)/4
** One hour consists of 4 time increments.

Once subjects had completed the fifth session, or Division Five, and answered the manipulation check question, they received the following message on their computer screen.

> Based on your experience working for the public accounting firm in this audit game, please indicate to what extent you agree with the following statements.

Subjects then responded to the fourteen post-experimental questions listed in Table A.26 which appeared one at a time on their computer screen in the following format.

Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
1	2	3	4	5	6

____ I believe that this accounting firm's reward structure discourages auditors from UNDERREPORTING the number of hours worked on audit procedures.

Table A.26
Summary of Post-experimental Questions

Variable	Actual Question Asked
QUEST1	I believe that this accounting firm's reward structure discourages auditors from UNDERREPORTING the number of hours worked on audit procedures. (This question was reverse coded.)
QUEST2	I believe that this accounting firm's reward system provides incentives to auditors to SIGN OFF on incomplete audit procedures.
QUEST3	I believe that this accounting firm's management provides incentives to their auditors to UNDERREPORT the number of hours spent working on audit procedures, despite their official written policy that forbids such behavior.
QUEST4	I believe that this accounting firm's management expects their auditors to SIGN OFF on incomplete audit procedures.
QUEST5	I believe that this accounting firm's written policy against SIGNING OFF on incomplete audit procedures is consistent with its reward system. (This question was reverse coded.)
QUEST6	I believe that this accounting firm's management expects their auditors to UNDERREPORT the number of hours spent working on audit procedures.
QUEST7	I believe that this accounting firm's management provides incentives to their auditors to SIGN OFF on incomplete audit procedures, despite the official written policy that forbids such behavior.
QUEST8	I believe that this accounting firm's reward system provides incentives to auditors to UNDERREPORT the number of hours spent working on audit procedures.
QUEST9	I believe that this accounting firm's reward system discourages their auditors from SIGNING OFF on incomplete audit procedures. (This question was reverse coded.)
QUEST10	I believe that this accounting firm's written policy against UNDERREPORTING the number of hours worked on audit procedures is consistent with its reward system. (This question was reverse coded.)
QUEST11	I believe that UNDERREPORTING the number of hours worked on audit procedures is OK under the circumstances present in the Audit Game that I just completed.
QUEST12	I believe that UNDERREPORTING the number of hours spent working on audit procedures is OK under any circumstances.
QUEST13	I believe that SIGNING OFF on incomplete audit procedures is OK under the circumstances present in the Audit Game that I just completed.
QUEST14	I believe that SIGNING OFF on incomplete audit procedures is OK under any circumstances.

The theoretical range of these variables is from 1 ("strongly disagree") to 6 ("strongly agree").

After completing the fourteen post-experimental questions subjects answered the eight demographic questions listed in Table A.27.

Table A.27
Demographic Questions

Demographic Questions
1. What is your gender? __ Male __ Female
2. What year in school are you? __ Sophomore __ Junior __ Senior __ Graduate
3. Are you an accounting major? __ Yes __ No
4. How many accounting courses have you completed? (Please include courses in which you are presently enrolled.) __ 1-2 __ 3-4 __ 5-6 __ 7-8 __ 9 or more
5. Have you ever worked as an intern in a Public Accounting Firm? __ Yes __ No
6. Where do you hope to start your accounting career? __ Corporate __ Public Accounting __ Governmental/Nonprofit __ N/A
7. Have you taken or are you currently enrolled in an Auditing class (A424)? __ Yes __ No
8. Did you attend the Coopers & Lybrand ethics presentation put on for Beta Alpha Psi on October 18, 1993? __ Yes __ No

After completing the demographic questions, subjects were instructed on their computer screens to turn in their computer disk and their five Performance Evaluations. They were paid based on their Performance Evaluation for Division Five and received any lottery numbers they had earned. They received their lottery numbers on the following form.

"Audit Game" Study
Connie Esmond
855-8966

Four Character Code _____

Your _____ Lottery Numbers for the drawing to be held on *Monday,*

November 22 at *7:00 p.m.* in *Room BU550* are numbers _____ through _____.

      You do not have to be present at the drawing to win a cash bonus. However, you will have to present this document to collect your bonus either at the time of the drawing or at a later date in BU530A. The winning numbers and amounts will be posted on the door of BU530A.

APPENDIX B

ADDITIONAL DATA ANALYSIS

This appendix provides a summary of the additional data analysis performed for this study. The first analysis presented below consists of a multivariate regression analysis of one binomial dependent variable on the independent variables, the mediating variables, and the remaining binomial dependent variable. This analysis was considered important due to the bimodal nature of the distribution of reporting behaviors (see Table B.1), which resulted in high standard deviations for the dependent variables of PERCNTSO and HOURSUR (see Tables 4.9 and 4.10). The reporting behavior data were categorized into binomial dependent variables (SIGNOFF, yes/no; UNDERREP, yes/no) and analyzed using the following multivariate regression equations. The results of this analysis are presented in Table B.2.

$$\text{SIGNOFF} = \alpha + \beta_1\text{PAYSTRUC} + \beta_2\text{BUDIMP} + \beta_3\text{CONFLTSO} \qquad (1)$$
$$+ \beta_4\text{CONFLTUR} + \beta_5\text{UNDERREP} + \epsilon$$

$$\text{UNDERREP} = \alpha + \beta_1\text{PAYSTRUC} + \beta_2\text{BUDIMP} + \beta_3\text{CONFLTSO} \qquad (2)$$
$$+ \beta_4\text{CONFLTUR} + \beta_5\text{SIGNOFF} + \epsilon$$

The results of this analysis support the LISREL model results presented in Chapter 4. In addition, the results support the use of the more informative continuous dependent variables as opposed to the binomial dependent variables used in Equations (1) and (2). Table B.2 shows that in the analysis for Equation (1), salary structure (PAYSTRUC) and ethical ambivalence for signing off early (CONFLTSO) have a significant effect on the reporting behavior of signing off early (SIGNOFF), while time budget importance (BUDIMP) and ethical ambivalence for underreporting (CONFLTUR) do not. In addition, the analysis for Equation (2) shows that only ethical ambivalence for underreporting (CONFLTUR) has a significant effect on the reporting behavior of underreporting hours (UNDERREP). These findings are consistent with the relationships presented by the path model depicted in Figure 4.1. However, because this multiple regression analysis is capturing only the direct effects of the independent and mediating variables on the dependent variables, the R^2's for these equations are quite low compared to the coefficient of determination of .878 produced by the LISREL model.

Because there is some question as to the propriety of running a regression analysis for binomial dependent variables, a nonparametric Pearson's R statistic was also obtained. The results were similar to the multiple regression results presented in Table B.2. Consequently, the nonparametric results are not presented in the paper.

Table B.1
Frequency Table for Reporting Behaviors

Variables							
PERCNTSO[a]				HOURSUR[b]		ACTUALHR[c]	
Value %	Freq.	Value %	Freq.	Value %	Freq.	Value	Freq.
0.0	78	37.5	1	0.00	71	0.00	71
6.0	1	42.0	1	3.38	1	0.35	1
9.5	1	44.5	1	3.41	1	0.36	1
10.5	1	48.0	1	3.47	1	0.37	1
12.0	1	50.0	2	5.66	1	0.60	1
14.5	1	58.0	1	5.93	1	0.63	1
15.0	1	63.0	1	6.43	1	0.68	1
16.0	1	93.0	1	7.05	1	0.82	1
17.0	1			8.09	1	0.88	1
18.5	1			9.30	1	1.00	1
19.5	1			10.63	1	1.03	1
22.0	1			11.67	1	1.19	1
22.5	1			11.86	1	1.52	1
23.0	2			13.10	1	1.75	2
24.0	1			13.26	1	1.82	1
24.5	2			14.78	1	1.96	1
26.5	1			16.00	2	2.31	1
27.5	1			16.53	1	2.38	1
29.0	1			16.67	3	2.40	2
29.5	3			18.23	1	2.43	1
30.0	2			18.83	1	2.50	3
31.0	2			19.22	1	2.83	1
31.5	1			20.00	2	3.00	3
32.5	1			20.34	1	3.08	1
33.0	1			20.67	1	3.10	1
34.5	1			22.06	1	3.26	1
35.0	1			23.55	1	4.60	1
35.5	3			24.77	1	4.75	1
36.0	1			30.67	1	5.00	20
36.5	1			32.20	1		
				33.33	20		
Totals			124		124		124
Mean		11.50%		9.39%		1.35	
Std. Dev.		17.69		12.93		1.92	

[a] The theoretical range of this variable is 0% to 100% non-completion of the task.

[b] The theoretical range of this variable is 0% to 100% hours worked that went underreported. However, no subjects were expected to underreport in excess of 33.33% since there was no reason to underreport more hours than those that exceeded the time budget. The time budget was 10 hours and 15 hours were needed to complete the task. The 33.33% was the maximum value as expected.

[c] The theoretical range of this variable is 0 to 15 hours worked that went underreported. This variable was not used in the data analysis reported in Chapter 4. The maximum value was 5 hours.

Table B.2
Regression of Binomial Dependent Variables on Mediating and Independent Variables

Variables	Beta	t-statistic	p-value
Dependent = SIGNOFF (Equation 1) N = 124 R^2 = .236			
PAYSTRUC	.212	2.49	.007[a]
BUDIMP	.036	.41	.340[a]
CONFLTSO	.437	4.50	.000[a]
CONFLTUR	-.094	- .93	.178[a]
UNDERREP	.068	.81	.418
Constant		8.87	.000
Dependent = UNDERREP (Equation 2) N = 124 R^2 = .092			
PAYSTRUC	.097	1.02	.155[a]
BUDIMP	.025	.27	.395[a]
CONFLTSO	-.055	.48	.314[a]
CONFLTUR	.284	2.62	.005[a]
SIGNOFF	.081	.81	.418
Constant		6.46	.000
[a] one-tail significance level			

The second multiple regression analysis presented below uses the same equations as Equations (1) and (2), but incorporates the continuous dependent variables that were used in the LISREL analysis. This analysis was performed to allow a comparison of the R^2s for a simple multiple regression and the LISREL path model analysis. Table B.3 presents the results for the following regression equations:

$$\text{PERCNTSO} = \alpha + \beta_1\text{PAYSTRUC} + \beta_2\text{BUDIMP} + \beta_3\text{CONFLTSO} \qquad (3)$$
$$+ \beta_4\text{CONFLTUR} + \beta_5\text{HOURSUR} + \epsilon$$

$$\text{HOURSUR} = \alpha + \beta_1\text{PAYSTRUC} + \beta_2\text{BUDIMP} + \beta_3\text{CONFLTSO} \qquad (4)$$
$$+ \beta_4\text{CONFLTUR} + \beta_5\text{PERCNTSO} + \epsilon$$

Table B.3 shows that the R^2s for Equations (3) and (4) are higher than those for Equations (1) and (2), but not nearly as high as the coefficient of determination produced by the LISREL analysis. It also appears that using the continuous dependent variables allows more insight into the relationship between the dependent variables than did the use of binomial dependent variables. Table B.3 shows a negative correlation between the dependent variables very similar to that produced by

the LISREL analysis. This relationship was not significant in the analysis that incorporated the binomial dependent variables. In addition, the effects of the independent and mediating variables on the dependent variables increase in significance, with the exception of the effect of ethical ambivalence for signing off (CONFLTSO) on the reporting behavior of underreporting hours (HOURSUR). The biggest increase shows up in the effect of salary structure (PAYSTRUC) on underreporting hours (HOURSUR). This relationship is depicted as an indirect relationship in Figure 4.1. However, since Equation (4) does not distinguish direct effects from indirect effects, nor does it allow for any relationships between the independent and mediating variables to surface, it is not surprising that this relationship is significant.[1] These limitations are considered to be the reason for the low R^2's produced by Equations (3) and (4) compared to that produced by the LISREL analysis.

Table B.3

Regression of Dependent Variables on Mediating and Independent Variables

Variables	Beta	t-statistic	p-value
Dependent = PERCNTSO (Equation 3) N = 124 R^2 = .334			
PAYSTRUC	.350	4.37	.000[a]
BUDIMP.	.097	1.20	.117[a]
CONFLTSO	.330	3.60	.000[a]
CONFLTUR	-.135	-1.41	.081[a]
HOURSUR	-.347	-4.33	.000
Constant		1.19	.238
Dependent = HOURSUR (Equation 4) N = 124 R^2 = .241			
PAYSTRUC	.262	2.94	.002[a]
BUDIMP	.108	1.25	.107[a]
CONFLTSO	-.049	- .48	.316[a]
CONFLTUR	.219	2.17	.016[a]
PERCNTSO	-.395	-4.33	.000
Constant		- .31	.758
[a] one-tail significance level			

[1]Note that the indirect relationship of PAYSTRUC on HOURSUR was significant at the .0005 level in the LISREL analysis (see Table 4.8).

The third multiple regression analysis set of equations presented below does not incorporate the mediating ethical ambivalence variables. The purpose of this analysis is to determine whether the inclusion of the mediating variables increases the explanatory power of the model. The lower R^2's for Equations (5) and (6) (see Table B.4) compared to those for Equations (3) and (4) respectively provide assurance that including the mediating variables in the analysis is appropriate.

$$PERCNTSO = \alpha + \beta_1 PAYSTRUC + \beta_2 BUDIMP + \beta_3 HOURSUR + \epsilon \qquad (5)$$

$$HOURSUR = \alpha + \beta_1 PAYSTRUC + \beta_2 BUDIMP + \beta_3 PERCNTSO + \epsilon \qquad (6)$$

Table B.4
Regression of Dependent Variables on Independent Variables

Variables	Beta	t-statistic	p-value
Dependent = PERCNTSO (Equation 5)　　N = 124　　R^2 = .260			
PAYSTRUC	.389	4.86	.000[a]
BUDIMP	.161	2.04	.022[a]
HOURSUR	-.394	-4.89	.000
Constant		-2.07	.040
Dependent = HOURSUR (Equation 6)　　N = 124　　R^2 = .207			
PAYSTRUC	.324	3.79	.000[a]
BUDIMP	.161	1.96	.026[a]
PERCNTSO	-.422	-4.89	.000
Constant		-1.26	.212
[a] one-tail significance level			

Finally, the two final multiple regression equations are identical to Equations (5) and (6) except that the underreporting dependent variable is based on the number of hours underreported (ACTUALHRS) as opposed to the percentage-based underreporting variable used throughout the study (HOURSUR) (see Table B.1 for a descriptive statistical comparison of these two variables). The percentage variable was used in the study to keep the scale of the dependent variables incorporated in the LISREL analysis consistent. Such consistency in scale provides a more meaningful analysis (Joreskog and Sorbom).

$$\text{PERCNTSO} = \alpha + \beta_1\text{PAYSTRUC} + \beta_2\text{BUDIMP} + \beta_3\text{ACTUALHRS} + \epsilon \qquad (7)$$

$$\text{ACTUALHRS} = \alpha + \beta_1\text{PAYSTRUC} + \beta_2\text{BUDIMP} + \beta_3\text{PERCNTSO} + \epsilon \qquad (8)$$

The results in Table B.5 do not appear to be statistically different from those in Table B.4. However, the results in Table B.4 (using percentage-based HOURSUR) are considered to be more reliable than those presented in Table B.5 (hours-based ACTUALHRS) since it seems important that this dependent variable should incorporate not only the number of hours underreported, but also the number of hours worked.

Table B.5
Regression of Dependent Variables on Independent Variables (Using Actual Hours)

Variables	Beta	t-statistic	p-value
Dependent = PERCNTSO (Equation 7) N = 124 R^2 = .286			
PAYSTRUC	.394	5.01	.000[a]
BUDIMP	.166	2.13	.017[a]
ACTUALHRS	-.427	-5.41	.000
Constant		-2.15	.034
Dependent = ACTUALHRS (Equation 8) N = 124 R^2 = .234			
PAYSTRUC	.331	3.93	.000[a]
BUDIMP	.166	2.07	.020[a]
PERCNTSO	-.458	-5.41	.000
Constant		-1.39	.167
[a] one-tail significance level			

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