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**THE ACQUISITION OF  
TASK-RELEVANT AUDIT KNOWLEDGE**

**by**

**Jon Michael Andrus**

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**A Dissertation Submitted to the Faculty of the  
COMMITTEE ON BUSINESS ADMINISTRATION**

**In Partial Fulfillment of the Requirements  
For the Degree of**

**DOCTOR OF PHILOSOPHY**

**In the Graduate College**

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As members of the Final Examination Committee, we certify that we have read the dissertation prepared by JON MICHAEL ANDRUS entitled The Acquisition of Task-Relevant Audit Knowledge

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## **Abstract**

It is widely held that the auditor's experience is the most important factor leading to the development and organization of the auditor's knowledge base (Waller and Felix 1984; Gibbins 1984). This study extends prior research by examining knowledge differences between auditors with similar amounts of public accounting experience (general domain experience) but with differing specific audit experiences and training. The study examines the association between experience and training and the auditors knowledge of the effectiveness of internal control and audit procedures to prevent and detect potential misstatements of financial statements. This particular knowledge is important in the performance of audit risk assessment and audit planning tasks. Risk assessment and audit planning tasks are important tasks that auditors begin to perform early in their auditing careers.

In order to test these relationships, 60 subjects with approximately one to two years of public accounting experience performed a knowledge retrieval task to assess their knowledge of the relationship between common financial statement misstatements and the control and audit procedures that would prevent or detect those misstatements. Self-reported measures of public accounting experience and estimates of experience and training relevant to various industries and audit activities were collected to develop measures of task-relevant experience and training.

The resulting evidence of this study provides limited support that differences in audit-cycle experience results in differences in the auditor's knowledge of effective internal

control procedures. The study also provides evidence that the knowledge of the relationships between internal control and audit procedures and potential misstatements to financial statements is acquired, at least in part, prior to obtaining significant experience in performing audit planning tasks.

## I. INTRODUCTION

### *Overview*

It is widely held that the auditor's experience is the most important factor leading to the development and organization of the auditor's knowledge base (Waller and Felix 1984; Gibbins 1984). The results of a number of recent studies indicate that differences in the content and organization of knowledge affect the auditor's performance in audit tasks (see Bédard, 1989; Davis and Solomon, 1989). Currently, little is known about the relationships between audit experience and training and the auditor's knowledge base. The purpose of this study is to extend prior research by investigating the extent to which the experience and training received in the early years of an auditor's career explain an important feature of the auditor's knowledge base, the ability to retrieve internal control and audit procedure knowledge.

This study extends prior research in a number of respects. First, the study examines knowledge differences between auditors with similar amounts of public accounting experience (general domain experience) but with differing specific audit experiences and training. A majority of prior studies relied on general experience (auditor tenure) or position (staff level) as measures of expertise. Auditors with similar amounts of public accounting experience or at the same staff level may differ significantly in the amounts of total audit experience, industry audit experience, transaction cycle audit experience, or experience in the performance of different audit procedures. Auditors at similar general

experience levels may also differ in the nature and extent of training received. These heterogeneous experiences and training are expected to result in differences in acquired audit relevant knowledge.

Second, the study examines the effects of specific experience and training on auditor knowledge. Examining the effects of experience on knowledge is appropriate since the content and organization of knowledge is believed to be a major determinant of task performance (Chi, et al. 1982). Recent studies have linked the content and organization of knowledge to differences in task performance (Bonner 1990; Libby and Frederick 1990; Bonner and Lewis 1990; Frederick 1991).

### *Motivation*

A primary motivation for this study is to expand and clarify our understanding of the relationships of experience, training, and individual factors with auditor knowledge which in turn affects audit task performance. A number of recent auditing studies have identified performance differences between experienced and inexperienced auditors. However, these studies have done little to consider how these differences might arise.

An increased understanding of the relationships between audit experience, training, and the development of the auditor's knowledge base has a number of potential benefits for both audit practitioners and researchers. Understanding the relationships between audit experience and audit performance may be useful in evaluating auditor proficiency. Audit practitioners should be interested in indicators of proficiency in order to comply with the first general standard of auditing requiring audits to be conducted by "a person or persons

having adequate technical training and proficiency as an auditor" (AICPA 1995, AU 150.02). Section 210 of the U.S. Auditing Standards states that the auditor's proficiency is obtained through a combination of formal education and professional experience (AICPA 1995, AU 210.03,04). For many audit tasks, proficiency itself is not easily observable. For example, it is difficult to observe an auditor's ability 1) to identify misstatements that could occur within a specified accounting system and 2) to identify the controls and audit procedures that would be effective in preventing or detecting those misstatements. Because of the limited ability to directly observe the proficiency of task performance, observable measures related to audit task proficiency should be useful to practicing auditors.

An increased understanding of the relationships between auditor experience and the auditor's knowledge base might also lead to improvements to auditor knowledge acquisition through improvements in audit training or audit experience. Improvements in the experience provided auditors might be achieved through modification to the procedures auditors are asked to perform or the decision aids used to assist task performance.

Understanding the relationships between experience, training, and the auditor's knowledge base also has potential benefits for audit researchers. Recent studies of auditor task performance recognize the importance of identifying when necessary task relevant knowledge is acquired (Frederick and Libby 1986; Abdolmohammadi and Wright, 1987; Bonner 1990; Bonner and Lewis, 1990). Bonner (1990) indicates that the mixed results of early studies of auditor performance differences may have resulted from failure to consider the degree to which the subjects had obtained the knowledge necessary for specific task performance. Audit researchers have often used general experience (auditor tenure) as a

surrogate for auditor "expertise" in the investigation of judgment limitations and judgment differences between novice and expert auditors. Audit tenure, however, does not seem to be a sufficient measure of auditor expertise (see Ashton, 1991). If hypotheses to be tested assume knowledge differences, an understanding of what audit experiences are likely to result in those knowledge differences would be helpful in the selection of subjects having the prerequisite knowledge level for their assigned group.

This study examines the association between experience and training and the auditors knowledge of the effectiveness of internal control and audit procedures to prevent and detect potential misstatements of financial statements. This particular area knowledge was selected for examination because it is important in the performance of audit risk assessment and audit planning tasks. The risk assessment and audit planning tasks are important tasks that auditors begin to perform early in their auditing careers. It is therefore expected that much of the knowledge necessary for task performance is acquired within the first two years of audit experience.

### ***Overview of Research Design***

The purpose of this study is to examine the relationship of the auditor's experiences and training to their acquisition of audit knowledge. Prior research on the effects of experience on the auditor's knowledge base have generally taken one of two approaches. The first is to take auditors with substantially different levels of experience and test for differences in knowledge structure and content. The second approach is to have auditors perform experimental tasks and then measure their differences in

knowledge content related to task performance. This study attempts to isolate knowledge differences resulting from differences in audit task experience and training for auditors with substantially the same level of public accounting experience. Examining auditors with substantially the same level of experience, in part, controls for the possibility that factors other than task-relevant experience and training, (such as attrition of less competent auditors) contribute to the auditor's knowledge differences.

In order to test these relationships, subjects performed a knowledge retrieval task to assess their knowledge of the relationship between common financial statement misstatements and the control and audit procedures that would prevent or detect those misstatements. Knowledge was measured in terms of the number of relevant control or audit procedures retrieved when prompted with a potential financial statement misstatement. Measures of the auditors experience and training were developed from a questionnaire administered following the knowledge retrieval task. Subjects were asked to provide self-reported measures of their total experience in public accounting as well as estimates of their experience and training relevant to various industries or audit activities. The measures of task-relevant experience and training were developed from responses to the questionnaire.

Subjects for the study consisted of auditors with a mean (standard deviation) of 14.62 (4.7) months of experience with two of the "Big Six" accounting firms<sup>1</sup>. Subjects were selected at this level of experience because it was expected that their individual

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<sup>1</sup> Subjects were requested to have between one and two years of public accounting experience. 55 of the 60 subjects participating reported between 9 and 18 months of experience.

experiences in performing various audit procedures for clients with different industries would vary greatly. Because the study is set in an auditing context, subjects were requested to have a majority of their experience in the practice of auditing.

In addition to experience and training, the auditor's ability and motivation are believed to have a significant effect both on the acquisition of knowledge and performance. This study omits consideration of ability and motivation for two primary reasons. First ability and motivation are difficult characteristics to observe. Motivation has been manipulated through monetary incentives in short term experiments of knowledge acquisition, but has generally been omitted from other studies of auditor knowledge acquisition and audit task performance. Self-reported measures of ability have been considered in studies of audit knowledge acquisition and audit task performance. These self-reported measures of ability are possibly confounded with the knowledge that the auditors have previously acquired.

Second, the study omits consideration of prior knowledge. While the auditors studied are at similar experience levels, they may have differed in their knowledge of the relationships of control and audit procedures to financial statement misstatements prior to beginning their careers in public accounting. Particularly of interest would be the effects of prior business experience on the auditor's initial knowledge base. The prior business experience of the subjects was collected, but was omitted from the study because very few of the subjects indicated that they had any relevant prior business experience.

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The current study focuses on the auditors ability to retrieve relevant controls and audit procedures when prompted with potential misstatement to the financial statement. Another important audit planning task that occurs prior to the task in this study is considering the characteristics of the accounting and control system and determining the likelihood of potential misstatements. This task is omitted from consideration in the current study.

### *Organization*

The remainder of the dissertation is organized as follows. Chapter II provides a review of the relevant studies of experience-related knowledge and performance differences and discusses theories of the acquisition of domain-relevant knowledge. The section goes on to develop hypotheses to examine how measures of task relevant training and experience relate to performance in a knowledge retrieval task. Chapter III describes the research method used to test the hypotheses. The results of the study are presented and discussed in Chapter IV. Chapter V discusses the contributions of the research and potential directions for future research.

## **II. Background and Hypotheses**

### ***Introduction***

This chapter discusses prior research regarding the importance of knowledge in expert judgment and the acquisition of audit knowledge. The chapter is presented in three sections. The first section discusses the prior research in the fields of accounting and psychology on the effects of knowledge and experience on task performance. The second section discusses prior research related to learning and knowledge acquisition. The third section applies the prior research to the case of the auditor learning from experience and develops the hypotheses.

### ***The Role of Knowledge in Task Performance***

Prior research in the fields of psychology and auditing has examined the role of knowledge in task performance. Studies of novice and expert performance have identified two major areas that distinguish novices from experts. Experts generally know more about the task domain and are better able to apply that knowledge (Kolodner 1983). Prior research also indicates that the increased ability of experts to apply their knowledge results from both differences in the organization of that knowledge and the development of more effective procedures for the application of that knowledge to the task (Carbonell, Michalski and Mitchell 1983; Anderson 1983).

Auditing is often characterized as a form of diagnostic decision making<sup>2</sup>. In a study of diagnostic decision making in the field of medicine, Feltovich (1981) found that experts exhibited a greater knowledge of the variation of disease states and a greater knowledge of the relationship of symptoms to the disease states. Expert radiologists in a study by Lesgold et al. (1981) exhibited a more integrated knowledge of features indicating abnormalities and a better general knowledge of anatomy. These studies of medical diagnosis are consistent with findings in other task domains including the game of chess (Chase and Simon 1973), and physics (Chi et al. 1982).

Research in the field of auditing indicates that experienced auditors have more extensive knowledge than inexperienced auditors. Weber (1980) found that experienced EDP auditors recalled a greater number of internal controls relevant to a complex data processing environment than inexperienced auditors. The experienced auditors in Weber's experiment were practicing internal and external auditors. Accounting students were used as surrogates for inexperienced auditors. The Weber study did find differences in the clustering of control responses between external auditors and internal auditors. Differences in the variety of experience with auditing computer systems was proposed as a possible explanation, but was not tested. Frederick and Libby (1990) found that audit managers

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<sup>2</sup>A diagnostic decision is where the decision maker evaluates cues in order to determine a current state or condition. Auditors also make prognostic decisions, where cues are evaluated in order to predict a future event or condition, such as the client's ability to remain in business.

generated a greater number of plausible error hypotheses and fewer implausible error hypotheses than students or staff auditors when prompted with a set of financial statement ratios. Bonner and Lewis (1990) found that the senior audit managers and senior auditors performed significantly better than accounting students in tests of knowledge of internal control structure and analytical procedures.

Auditing research has also tested experience related differences in the organization of audit knowledge. Frederick and Libby (1990) found evidence suggesting that, as auditors gain experience, the organization of their knowledge of financial statement errors by transaction cycle becomes more developed. In a later study, Frederick, et. al (1994) found that experienced auditors were able to sort financial statement errors across multiple dimensions. These findings suggest that as auditors gain experience their knowledge becomes more organized across multiple dimensions

Consistent with psychology research, auditing research suggests that differences in the extent and organization of knowledge are related to differences in the performance of audit tasks. Bonner and Lewis (1990) found an association between relevant knowledge and performance in a number of auditing tasks. Other studies relate audit experience and task performance. For example, Libby and Frederick (1990) found that more experienced auditors generated more plausible and fewer implausible explanations for changes in a set financial statement ratios. More recently, Bedard and Biggs (1991) found that auditors with recent domain-specific experience performed better in an error-hypothesis generation task.

In a selective review of the audit judgment literature, Libby and Luft (1993) propose a model where experience and ability are presented as antecedents of knowledge and performance is a consequence of both ability and knowledge. The study indicates that prior research has focused on routine audit judgments and necessarily employed general measures of experience. Libby and Luft stress the importance of developing more specific measures of knowledge and experience and examining all links of the model (experience and ability to knowledge as well as knowledge and ability to performance.)

Researchers in the fields of psychology and auditing attribute differences in task performance to differences in knowledge as well as the ability to apply that knowledge. Changes in knowledge content and the ability to apply knowledge has been defined as learning. The following section discusses the processes through which learning takes place and the effects of individual differences on learning.

### ***Learning Processes***

Models of learning identify three processes that result in the acquisition and refinement of knowledge; the storage of new knowledge in long-term memory, the creation of new knowledge by generalizing existing knowledge to different circumstances, and the refinement of existing knowledge through discrimination, strengthening, and decay (Kolodner 1983; Anderson 1983).

*Storage of Knowledge in Long-Term Memory.* Models of learning represent the initial storage of knowledge as the recording of a permanent trace (record) of knowledge

encoded in working or short-term memory into long-term memory. Short-term memory is modeled as the temporary storage location of facts and events, as well as procedures applying to those facts and events, that are encoded from the environment, or retrieved (activated) from long-term memory. Learning models represent long-term memory as the permanent (or relatively permanent) store of knowledge acquired over time (Anderson 1980). The knowledge (facts, conditions or procedures) encoded or retrieved into short-term memory guide the retrieval of knowledge in stored long-term memory producing judgment or action (Anderson 1983). Initial encoding of the knowledge to working memory may result from a number of sources including instruction or through reading a text. The knowledge may be observed directly in the environment, or the knowledge may be inferred or deduced in the process of solving a problem.

Anderson (1983) represents that the storage of a permanent trace of knowledge is probabilistic. Each item of information temporarily encoded to working memory has a chance of being permanently stored permanently in long-term memory. The probabilistic recording of knowledge to long-term memory is consistent with research indicating that learning is not significantly affected by intention or motivation to learn when the extent of processing is held constant (Nelson 1976). The creation of permanent traces of knowledge have also been found to occur automatically, without the subject's intent to learn (Hasher and Zachs 1979). Further, multiple presentations increase the likelihood of retention (Nelson 1977).

Several auditing research studies have examined the encoding of knowledge, primarily frequency knowledge, from experience. Butt (1988) examined the differential ability of auditors to encode frequency data from direct experience (observation of individual occurrences) and indirect experience (observation of summary data). The results indicated that frequency judgments of both experienced and inexperienced subjects were more accurate when presented with direct rather than indirect experience. A study performed by Libby and Frederick (1990) investigated the experience related differences in the content and structure of auditor knowledge of financial statement errors. The study examined auditors at three levels of experience, senior accounting students, audit seniors, and audit managers. In the study, experienced auditors generated a greater number of plausible error hypotheses than inexperienced auditors indicating more extensive knowledge relevant to the task domain. Experienced auditors also exhibited greater knowledge of the relative frequency of financial statement error occurrence.

Ashton (1991) examined the relationship of auditor experience with error frequency knowledge. The results indicate that differences in auditors' knowledge of errors are not explained by audit experience measured as 1) total auditor tenure, 2) industry-specific tenure, or 3) the number of audits performed in the relevant industry. Ashton suggests the findings may be due to auditors' limited direct experience with financial statement errors.

Studies in both psychology and auditing provide evidence that repeated exposure to an element of knowledge (fact, image, relationship, concept, etc.) results in the automatic

encoding of that item to long-term memory. The Ashton (1991) study, however, suggests that audit experience may not explain differences in auditors' error frequency knowledge because of their limited direct exposure to financial statement errors.

*Generalization.* Generalization provides for the application of existing knowledge to new situations with similar characteristics. One form of generalization, analogy, is the application of existing knowledge of previously encountered problems to unique problem situations with similar characteristics. The application of analogy in problem solving provides an opportunity for the storage of the inferred relationship in long-term memory (Anderson 1989).

An example of the application of analogy in an auditing context, is the inference of the effectiveness of an audit procedure in detecting an error. An auditor may have knowledge that agreement of a sample of shipping documents to the sales invoices is effective in detecting unbilled sales. By considering the characteristics of the audit procedure, the auditor may also determine that the procedure is effective in detecting other differences between shipments and billings, e.g., quantity billed differs from quantity shipped.

Marchant (1989) examined the differential use of analogy in audit problem solving between experienced auditors and accounting students. The results indicated that both experience levels used analogy in the solving of problems. Effects of the application of

generalization or analogy on the acquisition of knowledge has not been examined in the auditing literature.

*Refinement of Knowledge.* The content and organization of knowledge stored in long-term memory is refined through the process of discrimination as well as the strengthening and decay of knowledge. Discrimination represents refinement of knowledge through the storage of additional defining characteristics. A beginning auditor may fail to consider the source of the sample when generalizing the effectiveness of an audit procedure. For example, when testing for completeness of the recording of transactions, the auditor will select a sample from the underlying support documentation and agree the items with the entries recorded in the financial records. To test for the validity of a recorded transaction, the auditor performs same procedure, however the sample must be selected from the entries recorded in the financial statements. The sample entries are then agreed with the documentation supporting the transaction. When the auditor becomes aware that the effectiveness of the audit procedure for detecting different errors is dependent in part on the source of the sample, the auditor's knowledge base will be refined to incorporate that discriminating condition.

Repeated retrieval of existing knowledge increases the strength of the representation of that knowledge. The stronger the representation of the knowledge, the more likely that knowledge will be retrieved when appropriate conditions are met. In the absence of activation, the strength of knowledge representation decays over time and eventually

becomes so weak as to not be easily retrievable. The representations of inaccurate knowledge, or knowledge that is not successfully applied, decay in strength over time and become less likely to be retrieved. It is through the processes of discrimination, strengthening and decay that the organization of knowledge is refined.

*Individual Differences.* Individual differences in task performance and learning are believed to result from two primary sources: knowledge differences and capacity differences (Anderson, Conrad and Corbett 1989; Resnick and Neches 1984; Chi and Rees 1983). Horn (1990) reports that human abilities are both a determinant and a product of learning. Different individuals incur different experiences resulting in individual knowledge differences. These knowledge differences affect the ability of individuals to both successfully solve problems and acquire additional knowledge. Existing knowledge is an important factor to the ability to acquire new knowledge. Therefore those individuals beginning with a more extensive base of applicable knowledge in a task domain are likely to have a greater ability to learn from experiences within that domain.

Capacity differences include differences in the speed of processing and differences in the number of exposures necessary to notice similarities or differences in stimulus (Resnick and Neches 1984). Capacity differences restrict the ability to successfully solve problems and acquire knowledge. Individuals with greater capacities relevant to a task domain are likely to have a greater ability to learn from experiences within that domain.

The following section applies the issues discussed to the case of the beginning staff auditor. The section considers tasks performed by the beginning staff auditor and postulates how the performance of those tasks provides opportunities for the acquisition of knowledge relevant to the performance of audit tasks. This section also develops hypotheses about the relationships of audit task experience and training and the ability to retrieve audit knowledge.

### ***The Auditor's Acquisition of Knowledge***

Staff auditors, when they begin their auditing careers, will have an initial base of accounting and auditing knowledge from their college education<sup>3</sup> (Gibbins 1984; Waller and Felix 1984). Beginning staff auditors should have a basic understanding of accounting issues related to the recognition and measurement of assets, liabilities, owners equity and income and expenses. Beginning auditors, however, are likely to have more limited knowledge of the effects of the general business environment, control environment, accounting system characteristics, and the application and effectiveness of control policies and procedures on the likelihood of financial statement errors. Auditing courses may provide beginning auditors with rudimentary knowledge of control procedures that are effective in detecting or preventing certain types of errors. Likewise, auditing classes may

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<sup>3</sup>A beginning staff auditor may also have audit related knowledge obtained from experience in business environments. A student working as an accounting clerk or similar position while in school, or prior to returning to school, may acquire extensive knowledge of the operation of an accounting system.

provide beginning auditors with a limited knowledge of audit procedures that are effective in detecting the existence of and extent of certain financial statement errors. Further, beginning auditors are not likely to have extensive knowledge of the relative cost (in terms of audit effort) and effectiveness of those audit procedures.

Audit planning tasks are normally performed by senior auditors (Abdolmohammadi and Wright 1987; Haskins 1987). Therefore, much of the knowledge of the effectiveness of control and audit procedures useful in audit planning tasks must be acquired during the auditor's experience as an assistant or staff auditor. Duties of auditors at the assistant and staff level involve primarily the performance of tests of controls and tests of details of transactions and balances<sup>4</sup>. As auditors perform these tests, their knowledge of the effectiveness of control and audit procedures should increase and become more refined. The auditor's knowledge base is also affected by formal and informal training, discussions with other auditors, and the reading of professional and business literature.

The remainder of this section considers the effects of task-relevant experience, and task-relevant training on differences in performance in a knowledge retrieval task. Task-relevant experience is defined as audit experience within the industry and audit cycle examined in the knowledge retrieval task. Task-relevant training is defined as formal,

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<sup>4</sup>The duties of junior and staff auditors were, in part, determined in conversations with auditors from Big Six accounting firms.

continuing professional education relevant to the effectiveness of internal control policies and procedures and audit procedures in the industry and audit cycle examined.

*Task-Relevant Experience.* Through experience, the auditor encounters opportunities to acquire knowledge of the effectiveness of control and audit procedures from a number of sources. These sources include the auditor's experiences in reviewing planning documentation, referring to prior audit workpapers, performing tests of controls and tests of details of transactions and balances, formal (classroom) and informal (on-the-job) training, reading of business and professional literature and informal discussions with other auditors.

Prior to performing procedures in an audit area, the auditor reviews the related planning documentation. The planning documentation for an audit area includes a discussion of the risks of financial statement error as determined in the planning process as well as control policies and procedures implemented to prevent or detect the error. Planning documentation should also discuss the audit procedures designed to detect errors that might occur. Review of the planning documentation provides an auditor with the opportunity to acquire and store knowledge of control procedures that the planning auditor(s) determined were effective in reducing the risk of specific errors.

As the auditor performs tests of controls, the auditor may detect deviations in the existence or application of control policies and procedures. The auditor must then estimate the effects of detected deviations on potential financial statement errors and the adequacy of

planned substantive tests. Determining the effects of compliance deviations on the possibility of financial statement errors requires direct consideration of the relationship of control structure elements to potential errors (Waller and Felix 1987).

When errors are detected while performing tests of details of transactions or balances, the auditor is required to project those errors to the audit population (AICPA 1995, AU 350.25). When projecting detected errors to the audit population, the auditor should consider why control policies and procedures were ineffective in preventing or detecting the error (AICPA 1995, AU 350.27). This again requires direct consideration of the relation of control policies and procedures to financial statement errors. Knowledge of the conditions that led to the error and the characteristics of the internal control structure that allowed occurrence without detection allows the auditor to infer the occurrence of additional instances of that error.

As the auditor gains experience in a particular audit area, a more complete knowledge of control procedures that are effective in preventing or detecting potential financial statement errors is obtained. The amount of task-relevant audit experience, defined as time spent performing audit procedures in the relevant audit cycle and industry, should therefore be significant in explaining the ability of auditors to retrieve relevant control procedures when prompted with a potential financial statement error. The hypothesis to be tested is then:

H1a Auditors with a greater amount of **task-relevant audit experience** will retrieve a greater number of effective control procedures when prompted with potential financial statement errors.

The detection of an error while performing tests of details of transactions and balances provides the auditor with information about the effectiveness of the audit procedures in detecting specific errors. Ashton (1991) reports that auditors' experience with actual errors is limited. While Ashton's assertion is ordinarily true of material errors, it is more common to detect errors which are not material, and when considered with other errors, do not accumulate to a material amount (Kreutzfeldt and Wallace 1986). Detecting errors, even though the errors do not accumulate to a material amount, provides an opportunity to learn the effectiveness of the audit procedure in detecting similar errors of any size.

The auditor need not encounter an error in the performance of an audit procedure to learn information about the effectiveness of the procedure to detect errors. For example, upon initial consideration the auditor may believe that an error exists. However, upon further examination the auditor may determine that the condition does not constitute an error. Consideration of, and understanding the conditions that would constitute an error or exception when conducting an audit procedure provide an opportunity for linking audit procedures with errors. Further, information about what constitutes an error may come from

the audit program step describing the procedure, supervisor instruction, or reference materials.

When an auditor detects deviations in the existence or operating effectiveness of internal control procedures, either through tests of controls, or upon follow-up on errors encountered while testing the details of transactions or balances, the auditor must evaluate their effects on the nature, timing and extent of planned audit procedures. Also, in determining the effect(s) on planned audit procedures, the auditor considers errors that may result due to the absence of the control procedure and then evaluate the adequacy of audit procedures to detect those errors.

Each of the above situations provides the auditor with an opportunity to learn the effectiveness of the variety of audit procedures in detecting potential financial statement errors. Experience in a particular audit area results in a more complete knowledge of errors that could occur and of audit procedures that are effective in detecting those errors. The amount of task-relevant audit experience, defined as time spent performing audit procedures in the relevant audit cycle and industry, should therefore be significant in explaining the ability of auditors to retrieve relevant audit procedures when prompted with a potential financial statement error. This leads to the following hypothesis:

- H1b Auditors with a greater amount of **task-relevant audit experience** will retrieve a greater number of effective audit procedures when prompted with potential financial statement errors.

As discussed above, task-relevant experience will also lead to the refinement of the auditor's knowledge base of the relationships between potential misstatements and relevant control and audit procedures. With repeated performance of audit tasks, the auditor will develop a more complete knowledge base. A part of that development is the acquisition of additional defining elements. For example as an auditor develops a more complete knowledge of the accounting systems within a transaction cycle, their understanding of the effectiveness of related control and audit procedures will also increase. In addition the auditor encounters opportunities for the correction of inaccuracies in their knowledge base through feedback. As is noted in a number of previous studies, auditors rarely receive direct immediate feedback on their judgments. However, early in the auditor's career, a timely review is performed on all tasks completed by the auditor. If the auditor demonstrates inaccuracies in their understanding of audit concepts, the reviewer will provide the auditor with feedback relating to those inaccuracies. The refinement of knowledge resulting from an increased understanding of accounting systems as well as feedback from supervisors will result in improved accuracy of the auditor's knowledge base. This leads to the following hypotheses:

- H2a Auditors with a greater amount of **task-relevant audit experience** will retrieve fewer ineffective control procedures when prompted with potential financial statement errors.

- H2b Auditors with a greater amount of **task-relevant audit experience** will retrieve fewer ineffective audit procedures when prompted with potential financial statement errors.

*Task-Relevant Training.* At the beginning of their auditing careers, auditors receive formal training on their employer's audit approach and workpaper techniques. While the focus of initial training is not likely to be on various factors that affect the likelihood of financial statement errors, factors affecting specific errors may be presented as a part of discussions on the audit approach and documentation techniques. Throughout their careers, auditors receive formal continuing professional education (CPE) as required by the various State Boards of Accountancy, the AICPA, and their employers. Continuing education may cover a variety of topics related to auditing and accounting. To the extent that training applies to relevant control and audit procedures, it provides an opportunity to acquire knowledge about the effectiveness of control and audit procedures. This leads to the following hypotheses:

- H3a Auditors with a greater amount of **task-relevant training** will retrieve a greater number of effective control procedures when prompted with potential financial statement errors.
- H3b Auditors with a greater amount of **task-relevant training** will retrieve a greater number of effective audit procedures when prompted with potential financial statement errors.

The effects of training may be mitigated by a number of factors. Since the subjects will be early in their auditing careers, they will have received limited training. It is also likely that the subjects within each firm will have attended the same training courses. Because of these factors, training may not significantly differ among subjects and therefore should have only a limited differential effect on performance in the knowledge retrieval task.

In addition to formal continuing professional education, auditors also receive extensive informal, on-the-job training. The extent and effectiveness of informal training should vary extensively across individual auditors. Unfortunately, there is no easily observable measure of informal training. It is, however, expected that informal training will be correlated with experience in an industry and audit area. It is likely that the extent of audit experience will capture some of the variation in performance due to informal, on-the-job training. Subjects were asked to provide a subjective measure of the extent of on-the-job training they have received, but no formal hypotheses of the effects of informal training were tested.

### **III. EXPERIMENTAL METHOD**

#### *Overview*

This study examines the extent to which task-relevant experience and training might lead to the acquisition of knowledge relevant to the performance of audit tasks. This section describes the research method used to examine the ability of measures of experience and training to explain audit knowledge of the relationships of audit and control procedures. Measures of experience and training were developed from information gathered by questionnaire following the knowledge retrieval task. The dependent variable, task-relevant knowledge was measured as subjects' performance in a knowledge retrieval task

#### *Subjects*

The subjects participating in the study consisted of 60<sup>5</sup> staff auditors from two of the "Big Six" accounting firms. The firms were requested to provide subjects with approximately one to two years of public accounting experience primarily in the area of auditing. Subjects were selected at this level of experience for two reasons. First, the study identifies and reports differences in the initial acquisition of experience relevant to audit planning tasks. Subjects at the level of experience selected are at a stage in their careers

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<sup>5</sup> Eight of the 68 subjects participating failed to complete the questionnaire in sufficient detail to be included in the analysis.

when they typically begin performing audit planning tasks. As auditors exceed two years of experience, they generally become actively involved in audit planning and assessment of audit risks.

Second, the study examines the effects of differences in specific industry, audit area and audit task experience among auditors with similar levels of audit tenure. Subjects at the level of experience selected should differ considerably in their specific audit experiences relevant to the knowledge retrieval tasks of this study.

All subjects participating in the study held the position of Staff Accountant (Auditor) within their respective firms. Subjects reported between 8 and 37 months of public accounting experience with a mean (standard deviation) tenure of 14.62 (4.7) months. Each subject's experience was primarily in the area of auditing with subjects reporting a mean (standard deviation) of 82.75 (23.64) percent of their public accounting experience in the area of auditing<sup>6</sup>. Subjects reported working on an average of 8.5 audit engagements. Table 1 presents a summary of information on the subjects participating in the study.

The subjects also reported diverse experience among various industries. Industry experience was coded into eight categories. Subjects, on average, reported working in a mean (standard deviation) of 2.85 (0.92) different industries. Only three subjects reported working in a single industry<sup>7</sup>. A majority of the subjects (93%) reported experience in

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<sup>6</sup> One subject reported only 2 % of their total experience in the area of auditing with the remainder in Tax.

<sup>7</sup> One of the subjects with experience in a single industry reported 25 months of public accounting experience with only 2% of that experience in the area of auditing. The remaining two subjects reporting

between two and four industries with a single subject reporting experience in five of the eight industries.

Audit cycle experience was collected in three categories; revenue cycle, expenditures cycle and other. Subjects again showed a diversity of experience among audit transaction cycles. The subjects reported a mean (standard deviation) of 26.12 (16.71) percent of their time spent auditing the revenue cycle accounts, 26.67 (15.60) percent auditing expenditure cycle accounts, and 38.00 (25.85) percent auditing accounts related to other transaction cycles.

### *Procedure*

The research instrument was administered to the subjects in three separate sessions. Two of the sessions followed a staff meetings and firm training held away from the firm's office. The third session was conducted in the firm's office at the beginning of the business day. In all sessions, the experimenter was introduced to the subjects by a partner or manager of the firm. The researcher then gave a brief statement about the purpose of the study and distributed the research materials.

Each participant received a booklet containing background information on a fictitious audit client, the knowledge retrieval questions comprising the research task, and the post-research questionnaire. Participants were allowed to complete the instrument

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experience in a single industry reported 17 and 18 months of public accounting experience with 100% and 75% of their experience in the area of auditing.

and the post-research questionnaire without time restrictions. The experiment was designed to be completed in approximately 30 to 45 minutes. Most participants completed the materials within the anticipated time frame.

### ***Knowledge Retrieval Task***

The knowledge retrieval task for this study prompts subjects with potential financial statement errors and requests subjects to retrieve internal control and audit procedures relevant to specified errors from memory. To set the context for the research task, subjects were first provided with background materials describing a household product wholesaler. The background materials included a summary of the nature of the business and a limited description of the firm's accounting system. Background materials were kept brief both to reduce the time required to complete the research instrument and to prevent the subjects from limiting their retrieval of control procedures to those documented in the background materials.

Following the review of the background information, subjects were presented with two potential financial statement errors. Upon presentation of each error, subjects were requested to first record specific internal control policies and procedures that would effectively prevent or detect the potential error, then record specific substantive audit procedures that would effectively detect the potential error. The error prompts were selected from the revenue cycle (sales, billings and collections). The error prompts selected were from errors that are frequently encountered in audits (Coakley and Loebbecke 1985)

and for which a number of relevant control and audit procedures exist (as determined from auditing texts and audit firm materials).

The requirements of the knowledge retrieval task are consistent with audit activities performed in the audit planning process. When obtaining an understanding of internal control structure, required for all audits, the auditor should consider misstatements to the financial statement that could occur, factors affecting the risk of the occurrence of misstatements, and factors that influence the design of substantive tests (AICPA 1995, AU 319).

### *Independent and Dependent Variables*

The hypotheses developed in the previous chapter propose that performance in the retrieval of relevant control policies and procedures and audit procedures when prompted with a potential financial statement misstatement is, in part, explained by the auditor's task-relevant audit experience and training. This section discusses the data collected and used to test the relationship between task-relevant audit experience and training to performance in the knowledge retrieval task.

*Independent Variables.* The independent variables used in the study represent measures of the auditors task-relevant experience and training as follows:

TREXP      The measure developed representing task-relevant audit experience.

TRTRAIN    The measure developed representing task-relevant audit training.

The variables **TREXP** and **TRTRAIN** are developed from a questionnaire which solicited data about each subject. The questionnaire requested information about each subject's education, audit experience, and training. Subjects completed the questionnaire following their completion of knowledge retrieval task. A draft of the entire research instrument, including the questionnaire is provided as Appendix A of this dissertation.

Task-relevant audit experience (**TREXP**) is a measure of amount of each subject's audit experience within the relevant industry (product handling firms) and relevant accounting cycle (Revenue Cycle). **TREXP** was measured as the auditor's tenure measured in months multiplied by their reported auditing experience (as a percentages of public accounting experience) multiplied by the percentage of their experience auditing in the relevant industry and multiplied by the percentage of their industry experience spent auditing a revenue cycle accounts. Task-relevant training (**TRTRAIN**) was measured as the product of the auditor's total reported training hours times the estimated percentage of those hours addressing audit and accounting topics. These measures result in an estimate of the experience and training that are hypothesized to contribute to the knowledge of control and audit procedures relevant to the knowledge retrieval task.

Self-reported experience and training measures are used rather than recorded measures of the auditor's actual experience and training for two reasons. First, while public accounting firms maintain records on the time spent on particular audits (primarily for billing purposes), the records are generally not broken out by individual audit task, audit

cycle and industry. Training records are also maintained, in part for documenting compliance with continuing professional education requirements. While the training records include the course title and the content, the records generally do not provide sufficient detail to determine the amount of training relevant to devoted to audit and accounting topics relevant to particular audit tasks. The subjects' self-reported perception of audit and experience and training, while likely to be noisy, will provide a more detailed breakdown of training and experience than that available from firm records.

The second reason for using self-reported measures of training and experience was convenience.

Two important factors in the auditor's knowledge acquisition process are the individual's ability and motivation. Since easily observable measures of ability and motivation are not available, no attempt was made to capture measures of ability and motivation for this study. All subjects were staff accountants for two "Big Six" CPA firms. The selection procedures of the "Big Six" will likely result in the employment of individuals whose variance in ability and motivation is much less than the population as a whole. The self-reported grade point average of the subjects was collected during the study. GPA is likely to be of limited use because the narrow range of the GPAs reported by the subjects. In addition, there are a number of additional factors that affect GPA that may not be related to ability and motivation (outside activities and work schedules, family situations, etc.)

*Dependent Variables.* The dependent variables used for the study included the following:

AUDIT	Number of effective audit procedures retrieved when prompted with the potential financial statement error cues.
CTRL	Number of effective control policies or procedures retrieved when prompted with the potential financial statement error cues.

### ***Response Coding***

The responses of the knowledge retrieval task were scored by the author and an independent coder with over 20 years of public auditing experience. Internal controls and auditing procedures were assigned one of five categories depending on their effectiveness in relationship to the presented misstatements. Coding categories were defined as follows:

**Very effective** -- The described control procedure (audit procedure), if operating effectively would almost certainly prevent or detect (detect) the occurrence of the described misstatement.

**Effective** -- The described control procedure (audit procedure), if operating effectively, would probably result in the detection or prevention (detection) of the described misstatement.

**Possibly effective** -- The described control procedure (audit procedure), if operating effectively, has the possibility of preventing or detecting (detecting) the described misstatement, but generally would not be effective without the application of additional control (audit) procedures.

**Ineffective** -- The described control procedure (audit procedure), would not be effective in detecting or preventing (detecting) the described misstatement.

**Not a control (audit) procedure** -- The described procedure was not an internal control (audit) procedure.

Responses which were uninterpretable were coded as not a control (audit) procedure.

Initial overall agreement between the two coders was 58%. Much of the disagreement in coding related to controls that were coded as different but contiguous categories by the judges. When considering contiguous categories as agreement, overall initial agreement between the two coders was 91%.

To resolve the coding differences, a listing of internal control and audit procedure responses coded as very effective, effective, and possibly effective were prepared for each misstatement. The two coders then discussed those control and audit procedures which they had assigned to differing categories and came to an agreement as to the appropriate category. The categorized listings of the internal control and audit procedure responses for each of the misstatements are provided in Tables 3 - 6.

## IV. DATA ANALYSIS AND DISCUSSION

This chapter presents the analysis and test results for the hypotheses developed in Chapter II. The chapter is presented in five sections. The first and second sections present and discuss the resulting evidence of the examination of the effects of task-relevant experience on the auditors knowledge of effective control and audit procedures. The third section presents and discusses the resulting evidence of the of the examination of the effects of task-relevant training on the auditor's knowledge of control and audit procedures. The fourth section addresses the tests of hypotheses related to the effects of experience on the refinement of audit knowledge. A fifth and final section provides a short summary of the results section.

### *Experience and the Knowledge of Control Procedures*

Hypothesis 1a predicts that auditors with a greater amount of task-relevant audit experience will retrieve a greater number of effective control procedures when prompted with financial statement errors. The hypothesis was initially tested using multiple regression in the following form:

$$\text{CTRL} = \beta_0 + \beta_1 \text{TREXP} + \beta_2 \text{TRTRAIN} + \beta_3 \text{FIRM} \quad (1)$$

Where:

CTRL            The number of effective or very effective internal control policies or procedures retrieved when prompted with the potential financial statement error cues.

TREXP	The product of the subject's tenure in public accounting (in months), percentage of experience in auditing, percentage experience auditing within the wholesale, retail or manufacturing industries, and percentage of experience in the preceding industries spent auditing revenue cycle accounts.
TRTRAIN	The subjects total amount of continuing professional education (CPE) times the percentage devoted to accounting and auditing topics.
FIRM	An indicator variable representing the accounting firm employing the subject.

The resulting evidence of the initial regression model indicate that task-relevant experience and task-relevant training, as defined, were not effective in explaining performance in the retrieval of effective control procedures. (see Panel A of Table 7).

Because the dependent variable in this model is both discrete and of limited range ordinary least squares regression may be inefficient in fitting the regression. Because of this limitations, this and the other models in this section were also tested using polychotomous logistic regression (PLR). PLR is similar to logistic regression except that with PLR the model is not limited to a dichotomous dependent variable. A more detailed discussion of the PLR technique is included in Appendix B.

The resulting evidence of the PLR were consistent with the results of the multiple linear regression model indicating that none of the coefficients were significant. (see Panel B of Table 7).

As a further test for a relationship between task-relevant experience and performance in the knowledge retrieval task, an second regression was run substituting REVEXP, a measure of subjects' experience auditing within the revenue cycle, for the

measure of task-relevant experience. REVEXP was calculated as the subject's tenure in public accounting, multiplied by the percentage of audit experience times the percentage of that audit experience spent performing tests on revenue cycle accounts. The inclusion of REVEXP as a measure of task-relevant experience is appropriate for two reasons.

First, the misstatement prompts were both related to credit sales. While the initial measure of task-relevant experience incorporated only manufacturing and wholesale or retail sales, many service industry firms will have credit sales transactions similar to those in the product handling firms. Therefore the knowledge acquired while auditing a service industry firm may readily transfer to scenario of the research task. Second, most of the subjects reported a majority of their audit experience in the three industries. Therefore it was believed to be appropriate to test a measure of task-relevant experience that omitted the industry breakout. The resulting evidence of the second model is consistent with the first with only the variable representing audit firm indicating significance (see Panels A and B of Table 8).

Further consideration of the responses indicated that while most subjects (83%) were able to identify at least 1 effective control procedure, fewer subjects (32%) were able to identify procedures categorized as very effective. A third model was tested substituting the number of responses categorized as very effective for the dependent variable. The third model indicated that REVEXP, the measure of revenue cycle experience was significant ( $p < 0.03$ ) in explaining the retrieval of control procedures categorized as very effective (see Panels A and B of Table 9). The resulting evidence provides some support that experience in performing tasks in a specific audit cycle is

important to the acquisition of knowledge of the most effective controls within the audit cycle.

### ***Experience and the Knowledge of Audit Procedures***

Hypothesis 1b predicts that auditors with a greater amount of task-relevant audit experience will retrieve a greater number of effective audit procedures when prompted with financial statement errors. The hypothesis was initially tested using multiple regression in the following form:

$$\text{AUDIT} = \beta_0 + \beta_1 \text{TREXP} + \beta_2 \text{TRTRAIN} + \beta_3 \text{FIRM} \quad (2)$$

Where:

AUDIT            Number of effective audit procedures retrieved when prompted with the potential financial statement error cues.

The independent variables in the model are defined similarly to those of equation (1) described above.

Again, the initial model did not indicate that task-relevant experience was significant in explaining performance in the retrieval of effective audit procedures. The standardized regression coefficients were negative for all three independent variables and none of the variables were significant (see Panels A and B of Table 10). The initial model was revised to determine if revenue cycle experience (REVEXP), as defined above, was significant in explaining the retrieval of effective, or very effective audit procedures. The resulting evidence of the revised models also did not support a the hypothesis that

differences in task-relevant experience relate to knowledge of effective audit procedures (see Panels A and B of Table 11).

A review of the responses indicated that most of the subjects, 89 percent, were able to identify at least one effective or very effective audit procedure, with 43 percent of the subjects identifying audit procedures that were categorized as very effective. The lack of significance of the measures of task-relevant experience in explaining performance in the knowledge retrieval task may relate to subjects' relative success in identifying effective audit procedures. Audit procedures classified as effective or very effective for the two misstatement prompts included common tests such as the confirmation of accounts receivable, cut-off tests, tracing of shipments to recorded sales and vouching of recorded sales. The success of the subjects in the knowledge retrieval task for audit procedures indicates that the subjects have acquired the task-relevant knowledge either through their education, or early in their auditing careers.

### ***Training and Knowledge of Audit and Control Procedures***

Hypotheses 2a and 2b predict that auditors with a greater amount of task relevant training will be able to retrieve a greater number of effective audit and control procedures. The variable TRTRAIN, representing the amount of training the subject received times the portion of that training relevant to accounting and auditing, was included in each of the models tested above. The variable representing task-relevant training was not found to be significant in any of the models tested.

Two possible explanations are offered for this result. First, in the initial years of audit experience, auditors within each firm are likely receive substantially the same training. Second, the measure of training required the subjects to estimate the percentage of their training devoted to audit and accounting topics as well as the portion of that devoted to audit and accounting that was devoted to control and audit procedures. Since training, especially initial staff training, often addresses a wide range of topics it may be difficult for the subjects to estimate the percentage of their training relevant to audit and control procedures.

The self-reported measures of training indicate some support for both of the above explanations. A large percentage (35%) of the subjects employed by firm A indicated the same number of hours of training. This supports the first explanation -- that the subjects had received substantially the same training. Of the group reporting the same number of hours of continuing education all but one reported all of their training in the area of accounting and auditing, but estimates of the training relevant to audit and internal control procedures ranged from zero to sixty percent and zero to fifty percent respectively. This wide range of reported percentages may support the explanation that subjects had difficulty in estimating the content of their training. This difficulty would add noise to the measure of task-relevant training.

A less noisy estimate of task-relevant training might be obtained through analysis of firm training records. Although the number of hours of training would be an easily observable measure of formal training, the content of each course would need to be evaluated to determine the extent that it related to the tasks of interest.

### ***Experience and the Refinement of Audit Knowledge***

Hypotheses 3a and 3b propose that the refinement of the auditor's knowledge base as their task-relevant experience increases will result in the retrieval of fewer ineffective control and audit procedures. Regression models were run in the form:

$$\text{INCTRL} = \beta_0 + \beta_1 \text{TREXP} + \beta_2 \text{TRTRAIN} + \beta_3 \text{FIRM} \quad (3)$$

$$\text{INAUDT} = \beta_0 + \beta_1 \text{TREXP} + \beta_2 \text{TRTRAIN} + \beta_3 \text{FIRM} \quad (4)$$

Where INCTRL and INAUDT are defined as follows:

INCTRL      Number of ineffective control procedures retrieved when prompted with the potential financial statement error cues

INAUDIT      Number of ineffective audit procedures retrieved when prompted with the potential financial statement error cues.

The variables TREXP, TRTRAIN and FIRM were defined as described above.

The tests of the models did not support the hypotheses that subjects with a greater amount of task-relevant experience would retrieve fewer ineffective controls. Reviewing the data, it was noted that while a number of the subjects reported ineffective audit and control procedures related to the misstatement prompts, few subjects recorded more than one ineffective control procedure in each category. The lack of an inverse relationship between task-relevant experience and training and the recall of ineffective controls may be due to the limited number of ineffective controls recalled by subjects.

### ***Summary of Findings***

The resulting evidence does not support the hypotheses that audit cycle experience affects the auditor's knowledge of effective internal control procedures. Tests provide limited support that audit cycle experience is related to the auditor's knowledge of the most effective internal control procedures. This finding demonstrates that auditors within a narrow range of audit experience (tenure) may differ in their knowledge of internal controls resulting from differences in their specific audit experiences.

The study did not support similar findings relating experience with knowledge of effective audit procedures. The lack of effects may be a result of the ability of auditors to retrieve common audit procedures that are effective or very effective with only limited exposure to the audit procedures.

The findings also failed to support the relationship of task-relevant training on the auditor's knowledge of effective controls or audit procedures. The failure to support the above relationships may be a result of the lack of variability in training across subjects at a given experience level and noise in the measures used to represent task-relevant training.

The following section discusses the significance of the findings, possible improvements upon the research design, possible areas of examination in future studies.

## **V. CONTRIBUTIONS, LIMITATIONS, AND FUTURE RESEARCH**

### ***Contributions***

The purpose of this study was to further investigate auditors' experience-related knowledge differences. While previous research on auditor task performance has identified the importance of considering when the knowledge to perform a task is acquired (Abdolmohammadi and Wright 1987; Bonner 1990), little has been done to investigate what experiences might lead to the acquisition of the knowledge necessary for task performance. The resulting evidence of this study provides limited support that differences in audit-cycle experience is important in the acquisition of knowledge of control procedures effective in preventing or detecting misstatements within the revenue cycle. The study also provides evidence that this knowledge is acquired, at least in part, prior to obtaining significant experience in performing audit planning tasks

### ***Limitations***

A major limitation of studies of the effects of experience on auditor knowledge and task performance is the difficulty in isolating specific experiences that the auditor receives. Auditors potentially acquire knowledge from a number of different sources including formal instruction, performance of audit tasks, exposure to anecdotal evidence of the experiences of other auditors, and on-the-job training. Different auditors may receive vastly different experiences during all phases of their auditing careers. The design is limited in that it does not allow for control of individual components of audit experience. Extensions

of the current study could design experiments to control specific experiences that the subjects receive. An example would be to provide subjects with controlled simulated audit experience and examine knowledge differences resulting from that experience. Such studies have been performed, but have been limited to examining knowledge acquired over very short periods of time. Automated instructional tools similar to the LISP Tutor (Anderson 1990) could be developed to present students or auditors with realistic audit tasks and capture information to evaluate the nature and extent of both short-term and long-term performance improvements under various circumstances. Such a tool may also be useful in studying the development of procedural knowledge, another important aspect of learning not addressed in this study.

### ***Future Research***

It is widely held that the auditor's experience is the most important factor leading to the development and organization of the auditor's knowledge base (Waller and Felix 1984; Gibbins 1984). Much of auditing research treats experience in a general sense measuring experience either using tenure or staff level. Audit experience comprises many different activities including; obtaining an understanding of the client and their accounting and control systems, assessing the risks of misstatement, performing and evaluating tests of controls and substantive tests of transactions, projecting the effects of detected misstatements to the financial statements, reviewing the audit working papers and considering the adequacy of the testing performed, and considering the appropriate audit opinion, as well as a variety of other tasks. In addition to their task experience, auditors

receive both formal and on-the-job training and share in the experiences of other auditors by discussing findings and reading professional literature. Throughout their careers, individual auditors will receive different amounts of exposure to these different activities.

While past research has examined some of the dimensions of audit experience, such as industry experience and experience performing specific tasks, little research has been conducted on many of the dimensions of audit experience that provide opportunities for the acquisition of audit knowledge. Future research might examine the effects of different audit strategies such as the reliance on internal controls versus a primarily substantive approach or the application of statistical versus nonstatistical sample evaluation techniques on the acquisition of audit knowledge.

Past research has also focused on a limited number of audit tasks, primarily tasks related to risk assessment and the evaluation of the results of analytical procedures. Future research could also examine the tasks performed by auditors at various stages of their careers to determine both the knowledge necessary for task performance and how task performance might contribute to the auditor's knowledge base.

## **Appendix A**

### **Research Instrument**

#### **INSTRUCTIONS**

Thank you for your participation in this research project. The purpose of this research is to further our understanding of factors that lead to the acquisition of audit knowledge.

This experiment requires that you read through background material describing a hypothetical audit client in the wholesale consumer goods industry. You will then be asked to respond to questions relevant to an audit of a client such as the one described. The background material is provided only to establish the context for the questions.

Following completion of the audit related questions, you will be asked to complete a questionnaire about your audit training and experience.

The success of this study depends on your responses. Please follow the instructions carefully and make every attempt to do your best in answering both the audit related questions as well as the questionnaire administered at the end of the experiment. All responses to this research questionnaire will be kept confidential.

Your cooperation with this study is greatly appreciated.

## INTRODUCTION

This introduction provides background information about a wholesale firm and a brief description of portions of the firm's accounting system. The background information is provided to establish the context for the questions asked later in this document. Please read the background information carefully.

The Company's business consists of the sale and distribution of general merchandise, and integrated retail promotional programs to retailers. The principal product categories sold by the Company are housewares, gifts, plastic products for the home, closet accessories, glassware and the like.

There are no long-term arrangements or contracts which obligate any customer to purchase from the Company. The Company generally receives firm orders from its customers only a short time before shipment and consequently has no significant backlog of firm orders.

In the promotional marketing programs the Company sells various selected assortments of its products to retailing chains in various trading areas at different times throughout the year. In addition to the products, the Company generally furnishes related circulars and newspaper inserts for advertising the merchandise, together with other promotional advertising and display materials.

The Company sells these selected assortments of merchandise to its customers at fixed percentage discounts from the retail prices at which the merchandise is advertised for sale, resulting in uniform overall profitability to the Company's customer. The overall profitability to the Company of the promotional programs depends on the aggregate costs of the various items included in the assortments. The assortments are continually under review, items being added or discontinued from time to time based upon customer demand and overall profitability to the Company.

Promotional programs are the principal marketing vehicle for the Company's products. The promotional program, which enhances sales volume as compared to what might be attained independent of such programs, is the Company's primary area of expertise. Many of the Company's merchandise items are sold both as part of and independent of the promotional programs. The Company believes all of the items in the merchandise line are marketable independent of its promotional programs.

## RISK ELEMENTS OF THE COMPANY'S BUSINESS

The Company is currently subject to many business risks which could adversely affect its financial condition and/or ability to operate at a reasonable level of profitability. Many of these risks are inherent in any business while others, the Company believes, warrant specific discussion:

Recession. While few businesses are immune to potential adverse impact in a recessionary environment, the Company believes it may have substantial exposure in a prolonged period of recession. Customers often turn to the Company in periods of economic slowdown to increase retail store traffic through promotional programs designed to generate additional business. On the other hand, economic slowdown may adversely affect the financial health of the Company's customers. Many of the Company's customers are heavily leveraged, resulting in risk of the Company's loss of the account or inability of to collect accounts receivable from the customer.

Guaranteed Sales. In its dealings with its customers, the Company is experiencing increased demand for business where the customer retains the right to return goods which remain unsold at the close of the promotional period. The Company has traditionally sold its promotional programs with no customer return privileges and only modest amounts of goods have been shipped subject to returns.

## THE ACCOUNTING SYSTEM

### SALES

The Company maintains a sales force which negotiates the terms of the sale with the customer. One of the sales managers must approve all contracts prior to finalization. A customer list is maintained identifying all approved customers and indicating the total credit limit and available credit balance for each customer. Orders for approved customers with sufficient credit balance are automatically approved at the time of entry. Orders for customers not on the approved customer list or orders that result in a customer exceeding the approved credit limit are referred to the credit manager for approval prior to completing the sale.

### SHIPPING

Upon approval, order records are written to the warehouse "picking file". The picking file is sorted by the required shipment date of the order. Picking lists are generated from the file and used to assemble the orders for shipment. Orders are assembled near the loading dock and are segregated with florescent plastic ribbon. Orders are shipped through commercial shippers, FOB shipping point. When orders are ready for shipment the warehouse supervisor prints a bill of lading. When the goods have been loaded, the driver signs the bill of lading indicating receipt of the goods in good condition and the copy is routed to accounting. Printing the bill of lading also causes a record to be written to a file indicating that the sale has been shipped.

### BILLING

As copies of the bill of lading are received in accounting they are matched to the file indicating shipments to be billed and a computerized invoice is generated. The billing clerks agree the products and quantities ordered to those shipped. If they agree, the clerks initial and file the bill of lading and use the computer to generate a sequentially numbered sales invoice. The invoice is then mailed to the customer. Generation of the invoice automatically posts the sale to the customer's account in the accounts receivable subsidiary record, and records the sale in the sales journal.

### **RESEARCH TASK**

On the following pages you will be presented with two financial statement errors or irregularities that could occur in the recording of transactions for a business such as the one described.

For each error, you are asked to first identify control policies and procedures which would be effective in preventing or detecting the error. You are then asked to identify substantive audit procedures which would be effective in detecting the error.

Please attempt to identify as many effective control and audit procedures as possible and attempt to limit your responses to those procedures considered to be effective.

The following is an error or irregularity that could occur in the recording of transactions for the company described in the previous section:

**Merchandise is shipped to a customer, but no invoice is sent to the customer and the sale and accounts receivable are not recorded.**

Please list any **specific internal control policies or procedures** that you believe would be effective in preventing or detecting the above error. List **as many** effective control policies or procedures as you can recall.

The following is an error that could occur in the recording of transactions for the company described in the previous section:

**Merchandise is shipped to a customer, but no invoice is sent to the customer and the sale and accounts receivable are not recorded.**

Please list any **specific audit procedures** that you believe would be effective in detecting the above error in a company similar to the one described. List **as many** effective audit procedures as you can recall.

The following is an error that could occur in the recording of transactions for the company described in the previous section:

**Sales were recorded and customers billed for merchandise not shipped until the following accounting period.**

Please list any **specific internal control policies or procedures** that you believe would be effective in preventing or detecting the above error in a company similar to the one described. List **as many** effective control policies or procedures as you can recall.

The following is an error that could occur in the recording of transactions for the company described in the previous section:

**Sales were recorded and customers billed for merchandise not shipped until the following accounting period.**

Please list any **specific audit procedures** that you believe are effective in detecting the above error in a company similar to the one described. List **as many** effective audit procedures as you can recall.

### Background Questionnaire

Please answer the following questions as completely and accurately as possible. The success of this research is dependent on your best effort in answering these questions. All responses will be kept strictly confidential.

What is your current level (position) in your accounting firm?

\_\_\_\_\_

How many months have you worked in public accounting?

Current firm \_\_\_\_\_ (months)      Previous firms \_\_\_\_\_ (months)

Estimate the approximate percentage of your public accounting experience is in each of the following areas (sum should equal 100%):

Audit \_\_\_\_\_%      Consulting \_\_\_\_\_%      Tax \_\_\_\_\_%      Other \_\_\_\_\_%

If you had business experience in the areas of accounting, finance or management prior to entering your current public accounting position, please list 1) a brief description of the position; 2) the number of months worked; 3) the percentage of full time employment (full time = 100%), and 4) the percentage of time the position involved activities in the revenue cycle (sales, billings, or collections):

Position	Months Worked	% of Full Time	% Revenue Cycle
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

To the best of you ability, estimate:

- 1) The percentage of your total auditing experience that has been spent auditing clients in the industries listed below.
- 2) The number of audits you have performed in each of the industries listed below (Performing audits of the same client in two fiscal years should count as 2 audits).
- 3) The percentage of time within each industry spent auditing the **revenue cycle** (sales, billings, collections, accounts receivable), the **expenditures cycle** (purchases, payments, accounts payable), and **other areas** (payroll, inventory, financing, fixed assets, etc.).

The total of the % time spent in each industry should sum to 100%. The % time in each area should also sum to 100% for each industry. If you have no auditing experience within an industry, you may leave the entire row blank.

	% of time	# of Audits	-- % of industry experience in audit areas --		
			Revenue	Expenditures	Other
Manufacturing	_____	_____	_____	_____	_____
Service Industries	_____	_____	_____	_____	_____
Wholesale/Retail	_____	_____	_____	_____	_____
Government	_____	_____	_____	_____	_____
Utilities	_____	_____	_____	_____	_____
Other: (specify the industry)					
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Below are listed a number of audit activities. Please circle the appropriate response code to the left of each activity to indicate your level of experience with that activity in a financial statement audit.

The response codes are as follows:

- A I have not performed, or been involved in the performance of this activity.
- B I have assisted in the performance of the activity or collected data relevant to the activity.
- C I have had complete or primary responsibility for the performance of this activity.

	<b>AUDIT TASK</b>	<b>RESPONSE</b>
1	Preliminary analytic review procedures.	A B C
2	Establish engagement materiality.	A B C
3	Assess risk (inherent, control or detection risk).	A B C
4	Determine the nature and extent of tests of controls.	A B C
5	Determine the nature and extent of substantive audit tests.	A B C
6	Perform tests of internal controls.	A B C
7	Evaluate the effect of internal control deviations on planned substantive tests.	A B C
8	Project substantive errors to the audit population.	A B C
9	Conclude on the fairness of presentation of a financial statement account balance.	A B C

Below are listed a number of financial statement errors. Please circle the appropriate response code to the left of each error to indicate your experience with that type or error in a financial statement audit.

The response codes are as follows:

- A I have not encountered this type of error in a financial statement audit.
- B I have encountered an error of this type that **was neither** individually material, or material when combined with similar errors of this type.
- C I have encountered an error of this type that **was** individually material, or material when combined with similar errors of this type.
- D I have not directly encountered this type of error, but have direct knowledge of an error of this type occurring in an audit area, or on another audit to which I was not assigned.

To the right of the response codes, please estimate the number of audits in which you encountered or were directly aware of the occurrence of that type of error.

AUDIT TASK		RESPONSE	# Errors
1	Goods shipped but not invoiced.	A B C D	_____
2	Sales recorded but goods not shipped.	A B C D	_____
3	Sales invoiced but sale not recorded.	A B C D	_____
4	Sales recorded before legal title passes.	A B C D	_____
5	Invoice recorded incorrectly in the Sales Journal.	A B C D	_____
6	Invoice incorrectly priced.	A B C D	_____
7	Wrong quantity on shipping document and sales invoice.	A B C D	_____
8	Wrong quantity shipped (billing correct).	A B C D	_____
9	Wrong extension of quantity and sales price on invoice.	A B C D	_____
10	Wrong period credited for sale.	A B C D	_____
11	Duplicate shipment of merchandise (invoiced correctly).	A B C D	_____
12	Wrong customer billed.	A B C D	_____

Estimate to the best of your ability:

- 1) the total hours of continuing professional education you have received since entering the accounting profession. \_\_\_\_\_ hrs.
- 2) The percentage of your total CPE hours applicable to the areas of accounting and auditing. \_\_\_\_\_ %
- 3) The percentage of **accounting and auditing CPE** applicable to the evaluation of internal control structure within the revenue cycle (sales, billings and collections). \_\_\_\_\_ %
- 4) The percentage of **accounting and auditing CPE** applicable to the selection and application of audit procedures within the revenue cycle (sales, billings and collections). \_\_\_\_\_ %

List the college degrees you have earned and your area of concentration (accounting, finance, etc.):

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

List your college grade point average on a 4 point scale (4.0 = A):

Undergraduate \_\_\_\_\_ Graduate (if applicable) \_\_\_\_\_

List your approximate college grade point average for **accounting courses** on a 4 point scale (4.0 = A):

Undergraduate \_\_\_\_\_ Graduate (if applicable) \_\_\_\_\_

Indicate the sections of the Uniform CPA Exam you have completed:

Practice \_\_\_\_\_ Theory \_\_\_\_\_  
 Auditing \_\_\_\_\_ Law \_\_\_\_\_

Estimate the average amount of time you spend **each week** reading business or professional literature or journals (e.g. Wall Street Journal, Business Week, Fortune) other than that which is required as a part of your professional duties:

\_\_\_\_\_ hours per week

On the spaces provided allocate 100 points to indicate your perception of the relative importance of each of the following in the development of knowledge of the effectiveness of internal control procedures to prevent or detect errors or irregularities, and the effectiveness of audit procedures to detect errors or irregularities. Each column should sum to 100.

Source of Knowledge	Contribution to internal control effectiveness knowledge	Contribution to audit procedure effectiveness knowledge
College accounting education (in general)	_____ pts.	_____ pts.
College auditing course(s)	_____ pts.	_____ pts.
Initial staff training	_____ pts.	_____ pts.
Formal continuing professional education, (CPE)	_____ pts.	_____ pts.
Informal (on-the-job) training	_____ pts.	_____ pts.
Performance of tests of internal controls	_____ pts.	_____ pts.
Performance of substantive audit procedures	_____ pts.	_____ pts.
Performance of internal control evaluation and audit planning	_____ pts.	_____ pts.
Independent reading and study (not required as a part of the job)	_____ pts.	_____ pts.
Preparation for the CPA Examination	_____ pts.	_____ pts.
<b>Total</b>	<u>100</u> pts.	<u>100</u> pts.

## **Appendix B**

### **Polychotomous Logistic Regression**

Logistic regression is a technique useful in overcoming the shortcomings of ordinary least squares (OLS) regression when the dependent variable is dichotomous. When the dependent variable is dichotomous a number of the assumptions of OLS regression are violated including the assumptions of homoskedasticity and normality of the error term (Menard, 1995). In logistic regression, the dependent variable is replaced with a dependent variable representing the natural log of the odds that observation falls into the higher of the two categories.

Polychotomous logistic regression (PLR) extends the technique of logistic regression to dependent variables representing more than two discrete categories or values. PLR analysis can be performed for either nominal or ordinal categorical dependent variables. For a dependent variable representing  $M$  categories, PLR estimates  $M-1$  equations, each of the equations estimating the probability of membership in a category relative to a reference category (generally either the first or last category). In the case of an ordinal dependent variable, the  $M-1$  equations estimate the probability of membership in a category greater than that of the reference category. The ordinal PLR model is in the form:

$$p[y < j] = \frac{e^u}{1 + e^u}$$

Where:

$$u = \alpha + \beta X_1 + \beta X_2 + \dots + \beta X_{m-1}$$

The coefficients in the resulting regression model are analogous to the coefficients in a linear regression model. The coefficients represent the change in the independent variable associated with a one unit change in the dependent variable. The significance of the coefficients are tested by the Wald test which divides the coefficient by the standard error of the coefficient resulting in a z statistic. The significance of the model is examined by comparing the full model with the model containing only the constant. Two times the difference between the log-likelihood of the full model and the log-likelihood of model containing only the constant is distributed chi-square.

While PLR addresses a number of the problems associated with discrete, multivalued dependent variables, in the case where the dependent variable is ordinal the ordinary least squares regression is very robust to the problems related to the multichotomous dependent variable (Menard, 1995).

## **Appendix C**

### **Tables**

**Table 1**  
**Subject Information**

Number of Subjects	68
Unusable Responses	8*
Usable Responses	60
Firm Affiliation:	
Firm A	34
Firm B	26

	Minimum	Maximum	Average	Std. Dev.
Public Accounting Experience (Months)	8	37	14.62	4.7
Audit Experience (Percent)	2	100	82.75	23.64
Audit Engagements	1	31	9.2	5.7
Industries Audited	1	5	2.85	0.95

\* Eight subjects failed to provide sufficient detail of their auditing experience necessary for the data analysis.

**Table 2**  
**Reported Industry Audit Experience**

Industry	Number of Subjects	Number of Audits		Percent of Audit Experience	
		Mean	Std. Dev.	Mean	Std. Dev.
Manufacturing	46	3.28	3.24	38.83	27.89
Service	40	3.38	2.88	40.95	27.75
Wholesale	28	2.25	1.84	26.75	17.41
Government, Not-for-profit, Colleges and Universities	11	2.55	3.64	25.36	23.77
Utilities, Cogeneration	16	1.38	0.50	15.31	11.38
Finance, Real Estate	18	4.67	4.97	43.89	26.21
Oil and Gas, Energy	5	2.00	1.41	36.00	15.17
Entertainment, Gaming	7	2.86	3.53	38.29	39.43

**Table 3****Control Procedures, Misstatement 1**

**Merchandise is shipped to a customer, but no invoice is sent to the customer and the sale and accounts receivable are not recorded.**

**Very Effective**

Automatic Generation of sales invoices at the time the shipment is recorded.

Preparation of invoice prior to release of shipment.

**Effective**

Periodic reconciliation of shipments (from bills of lading or shipping logs) to sales invoices and recording of sale.

Timely review of all unbilled shipments

Timely review of "open" sales orders.

**Possibly Effective**

Matching of a bill of lading copy with invoice and recording of sale.

Forwarding a copy of the bill of lading to accounting for follow-up.

Sequentially prenumbered documents.

Recording of all shipments in a shipping log.

Bill of lading includes space for invoice number.

Periodic reconciliation of sales journal to inventory movements.

**Table 4****Audit Procedures -- Misstatement 1**

**Merchandise is shipped to a customer, but no invoice is sent to the customer and the sale and accounts receivable are not recorded.**

**Very Effective**

Trace a sample of bills of lading to invoices and recording in sales journal and accounts receivable ledger.

Reconcile shipping logs with invoices and recording of sales.

**Effective**

Reconcile bills of lading with sales invoices.

Reconcile sales orders with invoices and recording of sales and accounts receivable.

**Possibly Effective**

Sales cutoff tests.

Analysis of sales in comparison to prior years.

Confirmation of accounts receivable.

Analytic tests of inventory, sales and accounts receivable.

Agreement of invoices to recorded sales and accounts receivable.

Review of unbilled sales orders for old items.

Ensure all bills of lading are accounted for.

**Table 5****Control procedures misstatement 2**

**Sales were recorded and customers billed for merchandise not shipped until the following accounting period.**

**Very Effective**

Automatic generation of invoice only upon entry of shipment information.

Computer controls to prevent closing with unbilled shipments.

**Effective**

Prepare invoice and record sales only upon receipt of evidence of shipment.

Periodic reconciliation of recorded sales and shipments.

Matching of invoice and bill of lading dates.

Review and resolve unbilled bills of lading as of period end.

**Possibly Effective**

Use prenumbered documents

Year-end cutoff procedures

Require signatures on all bills of lading.

Timely processing of sales invoices.

Clearly marked shipping date on all bills of lading.

Route bill of lading to billing

Segregation of shipping/billing and recording functions.

Management review of all credits.

Retention of bill of lading by shipping until goods are shipped.

**Table 6****Audit Procedures Misstatement 2**

**Sales were recorded and customers billed for merchandise not shipped until the following accounting period.**

**Very Effective**

Select a sample of recorded sales transactions and vouch to evidence of shipment in the proper period.

**Effective**

Cutoff testing.

Confirmation of accounts receivable

Reconciliation of sales with shipping records.

**Possibly Effective**

Analytic comparison of gross profit between years.

Analysis of monthly sales.

Review of unshipped items at year end to ensure that they are recorded in the following year.

Review subsequent receipts.

Table 7

**Task-Relevant Experience and the  
Retrieval of Effective and Very Effective Control Procedures**

*Panel A -- Ordinary Least Squares Regression Model*

Variable	Beta	t-statistic	Significance
Task-Relevant Experience	-0.08	-0.56	0.58
Task-Relevant Training	-0.14	-0.99	0.33
Audit Firm	-0.28	-1.90	0.06
Multiple R <sup>2</sup> = 0.1315		p < 0.082	

*Panel B -- Polychotomous Logistic Regression Model*

Variable	Coefficient	Significance
Task-Relevant Experience	0.065	0.659
Task-Relevant Training	0.060	0.398
Audit Firm	0.967	0.079
Model chi-square significance p < 0.001		

Table 8

**Revenue-Cycle Experience and the  
Retrieval of Effective and Very Effective Control Procedures**

*Panel A -- Ordinary Least Squares Regression Model*

Variable	Beta	t-statistic	Significance
Revenue Cycle Experience	-0.17	-1.23	0.22
Task-Relevant Training	-0.14	-0.97	0.34
Audit Firm	-0.31	-2.16	0.04
Multiple R <sup>2</sup> = 0.1531		p < 0.048	

*Panel B -- Polychotomous Logistic Regression Model*

Variable	Coefficient	Significance
Revenue Cycle Experience	0.122	0.251
Task-Relevant Training	0.006	0.385
Audit Firm	1.110	0.048
Model chi-square significance p < 0.001		

**Table 9**

**Revenue-Cycle Experience and the  
Retrieval of Very Effective Control Procedures**

***Panel A -- Ordinary Least Squares Regression Model***

Variable	Beta	t-statistic	Significance
Revenue Cycle Experience	0.32	2.29	0.03
Task-Relevant Training	0.01	0.07	0.95
Audit Firm	0.16	1.10	0.28
Multiple R <sup>2</sup> = 0.1105		p < 0.135	

***Panel B -- Polychotomous Logistic Regression Model***

Variable	Coefficient	Significance
Revenue Cycle Experience	-0.3125	0.021
Task-Relevant Training	-0.0023	0.793
Audit Firm	-0.8493	0.222

Model chi-square significance p < 0.001

**Table 10**

**Task-Relevant Experience and the  
Retrieval of Effective and Very Effective Audit Procedures**

***Panel A -- Ordinary Least Squares Regression Model***

Variable	Beta	t-statistic	Significance
Task-Relevant Experience	-0.10	-0.75	0.46
Task-Relevant Training	-0.23	-1.57	0.12
Audit Firm	-0.08	-0.57	0.57
Multiple R <sup>2</sup> = 0.0859		p < 0.234	

***Panel B -- Polychotomous Logistic Regression Model***

Variable	Coefficient	Significance
Task-Relevant Experience	0.109	0.417
Task-Relevant Training	0.011	0.151
Audit Firm	0.432	0.439

Model chi-square significance p < 0.001

Table 11

**Revenue-Cycle Audit Experience and the  
Retrieval of Effective and Very Effective Audit Procedures**

*Panel A -- Ordinary Least Squares Regression Model*

Variable	Beta	t-statistic	Significance
Revenue Cycle Experience	0.07	0.48	0.63
Task-Relevant Training	-0.23	-1.53	0.13
Audit Firm	-0.08	-0.53	0.60
Multiple R <sup>2</sup> = 0.0796		p < 0.268	

*Panel B -- Polychotomous Logistic Regression Model*

Variable	Coefficient	Significance
Revenue Cycle Experience	-0.051	0.642
Task-Relevant Training	0.010	0.165
Audit Firm	0.420	0.461
Model chi-square significance p < 0.001		

Table 12

**Revenue-Cycle Audit Experience and the  
Retrieval of Very Effective Audit Procedures**

*Panel A -- Ordinary Least Squares Regression Model*

Variable	Beta	t-statistic	Significance
Revenue Cycle Experience	0.017	0.38	0.71
Task-Relevant Training	-0.001	-0.32	0.75
Audit Firm	-0.418	-1.96	0.06
Multiple R <sup>2</sup> = 0.1057		p < 0.150	

*Panel B -- Polychotomous Logistic Regression Model*

Variable	Coefficient	Significance
Revenue Cycle Experience	-0.073	0.544
Task-Relevant Training	0.005	0.590
Audit Firm	1.182	0.461
Model chi-square significance p < 0.001		

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