AN ANALYSIS OF CONFIDENCE LEVELS AND RETRIEVAL OF PROCEDURES ASSOCIATED WITH ACCOUNTS RECEIVABLE CONFIRMATIONS

DISSERTATION

Presented to the Graduate Council of the
University of North Texas in Partial
Fulfillment of the Requirements

For the Degree of

DOCTOR OF PHILOSOPHY

By

Violet C. Rogers, B.B.A., M.B.A.
Denton, Texas

December, 1993

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The study addresses whether differently ordered accounts receivable workprograms and task experience relate to differences in judgments, confidence levels, and recall ability. The study also assesses how treated and untreated inexperienced and experienced auditors store and recall accounts receivable workprogram steps in memory in a laboratory environment. Additionally, the question whether different levels of experienced auditors can effectively be manipulated is also addressed.

A primary motivation for confidence and reliability research involving the accounts receivable confirmation comes from criticisms that the accounts receivable confirmation procedure is used excessively at the expense of alternate procedures. Consequences of over-confidence include failure to search for additional evidence, a disregard for optional auditing procedures, and possible audit failure.

This study assumed that auditors use two methods of memory organization; schematic and taxonomic. An important

goal of the study was to show that some types of auditors are more prone to naturally organize their memory taxonomically (categorically) and that other auditors are capable of organizing the task in a variety of ways.

Interesting findings are that both confidence and recall ability increased with experience. Additionally, for the taxonomic group, auditors had more confidence in the accounts receivable procedure as it related to the existence assertion as compared to the valuation assertion. However, the treatments did not induce differences between schema treated and taxonomic treated confidence levels.

An important finding of the study was that experienced auditors were more capable of organizing their output according to experimentally induced taxonomic or schematic treatment. Hence, the experienced auditor could effectively think about the accounts receivable audit task either by assertion or by temporal order. Alternatively, inexperienced auditors did not effectively respond to treatment.

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CHAPTER I

INTRODUCTION

The purpose of the study is to address whether experienced and inexperienced auditors express differences in confidence and reliability levels associated with the accounts receivable confirmation. Additionally, questions of whether differently ordered accounts receivable audit workprograms relate to these expected differences are also addressed. Another purpose is to determine if differently organized workprograms influence order or organization of recalled accounts receivable audit workprogram procedures.

A primary motivation for confidence research involving the accounts receivable confirmation comes from criticisms that the procedure is used excessively at the expense of alternate procedures. At one extreme, auditors relying too heavily on the confirmation procedure are likely to ignore optional auditing procedures [Hall and Renner 1991] and abort searches for additional evidence [Kruglanski and Freund 1983]. At the other extreme, auditors relying too lightly on the confirmation procedure may be wasting valuable resources. Additionally, inter-judge estimates may differ widely. Finding support for these differences provides information for auditors to use in improving their

standard work programs, review procedures, and quality control documents.

There has been a great deal of interest in the reliability of accounts receivable confirmations. Confirmations are a standard form of gathering documentary evidence to support field work, and underlying financial statement assertions. This direct communication with debtors supposedly promotes a degree of reliance on the accounts receivable number and internal control procedures. Recently, the confirmation, as a form of evidence, has come under scrutiny [Caster 1992]. Hall and Renner [1991] suggest that while auditors understand common problems associated with the use of accounts receivable confirmations including low response rates and high error percentages [Hall and Renner 1991], all to often, they ignore the problems and place too much reliance on the procedure. Supposedly, the high reliance causes a lack of skepticism.

This lack of skepticism is supported by Einhorn [1978] who implies that problems of high reliance culminate in over-confidence in fallible judgment. In an audit of accounts receivables, the auditor makes a judgment as to the reliability of the confirmation results. This reliability judgment encompasses evaluating such variables as accuracy, completeness, and confirmation validity. Einhorn [1978] implies that over-confidence in this judgment manifests

itself in ignoring or mis-weighting alternate auditing procedures and evidence.

Experimentally, Caster [1992] and others [Warren 1975] partially support suspicions of over-reliance, by finding that a large percentage of confirmation results are indeed unreliable. However, results of these studies answer only part of the question. The controlled experiments failed to test for both auditor opinion regarding confirmation reliability and confidence in that opinion. It could be possible that some auditors may not recognize inherent problems, while others understand them fully and compensate by using alternative auditing procedures. Additionally, Statement on Auditing Standards No. 67 (SAS 67) recommends using the procedure in almost all auditing cases. Thus, the criticisms of "too much reliance" and over-confidence remain unanswered.

This study will direct the search for differences in reliability assessments and confidence levels by researching three factors. These factors include (1) knowledge of the outcomes of the procedures (2) past experience with accounts receivable audits and (3) adequate recall of accounts receivable audit procedures. A short discussion of these three factors concludes this introduction section.

Frederick [1991] implies that knowledge and understanding of the outcome of auditing procedures (such as accounts receivable confirmation results) can be modeled in

at least two separate ways. One model would organize accounts receivable workprogram steps as a normal accounts receivable audit routine. This could be accomplished by organizing standard workprogram procedures in a temporal fashion. Examples of such a routine can be found in the AICPA Audit and Accounting Manual [1988] and respective CPA firm manuals. These standard workprograms typically divide audit procedures by account title and consist of normal compliance and substantive tests associated with that account. Typically, a program for accounts receivable would begin with preliminary substantive procedures such as accounts receivable confirmations and culminate with an analysis of doubtful accounts.

A second model divides normal audit procedures by assertion/objective (including existence, valuation, completeness, presentation and disclosure, and rights and obligations). This model also consists of the same standard tests described above, yet organizes them by assertion. Such a routine for accounts receivable would include accounts receivable confirmations as a primary or secondary source of evidence for some of the five assertions. Although workprogram design rarely parallels auditing by assertion/objective, it is common for the auditor to understand the task in this way. Evidence of this understanding is found in first year auditing texts and standard audit manuals.

Pincus [1991] suggests that a second factor affecting reliability and confidence level assessments is past reliance on the confirmation procedure. This factor includes experience effects and knowledge of past errors. Her suggestion is that as past experience is remembered, the experienced auditor, as compared to the inexperienced auditor, may place a lower degree of reliance on the results of the procedure. But as Einhorn [1978] and Pincus [1991] point out, confidence in the judgment made by the more experienced auditor may be higher. Possibly this is the result of greater capacity of experienced auditors to understand output feedback regarding the relative frequency of errors. Alternatively, inexperienced auditors may remember fewer errors and exhibit a higher degree of reliance on the results of the procedure, while confidence in the judgment may be lower.

Frederick [1986; 1991] suggests that a third factor affecting reliability and confidence levels is adequate recall of the procedure. Hopefully, auditors remember the details of the task they performed, but this may not always be the case. Some authors [Alba and Hasher 1983] posit that if the task is considered to be fairly routine, auditors may fill in blanks in their memory by adding normal steps that were not necessarily completed. Other authors [Moser 1989; Frederick 1986] posit that remembering may partially block the recall process. As such, auditors may exhibit some type

of output interference by which, the first items remembered block additional remembering and affect reliability assessments and confidence in judgment.

This paper evolves around using these factors to assess both auditor reliability judgments concerning accounts receivable confirmations and respective confidence in those judgments. This paper initially provides background concerning the accounts receivable confirmation procedure. The second section develops the research questions and the hypotheses to be tested. The third, fourth, and fifth sections describe the research methodology, data analysis, and analysis results. The final section includes a summary of conclusions, limitations and extensions.

CHAPTER II

BACKGROUND

Historically, there has been much interest in reliability of confirmations and confidence placed in accounts receivable reliability judgments. Before the late 1930's, the confirmation procedure was an optional part of any audit. The Securities and Exchange Commission (SEC), in an investigation of McKesson and Robbins, recommended that the confirmation procedure be made mandatory.

The SEC concluded that Price Waterhouse, and Company, as auditors of McKesson and Robbins, did not confirm receivables nor observe inventory. Instead, the auditors relied upon the clients internal records. The investigative report criticized this omission by accusing the auditors of being negligent, and overly limited in scope. Specifically, the SEC accused the auditors of not gathering enough outside evidence and not having an appropriate degree of inquisitiveness and vigilance. In Accounting Series Release #19 [December 5, 1940], the SEC recommended that receivable confirmations and inventory inspections be added as mandatory procedures for expressions of unqualified opinions.

Discussions regarding this issue could be found in daily press coverage, the Journal of Accountancy and various

state journals [Caster 1991]. Editors of the Journal of Accountancy responded to ASR #19 by recommending extensions of auditing procedures [Barr and Galpeer 1987] in Statement on Auditing Procedures #1 [SAP #1]. This statement recommended confirmations "whenever practicable" [Caster, 1992].

The authors of most of the accounting coverage during this time, agreed with the recommended procedures of SAP#1 and ASR #19 and wrote as if these new standard procedures were already generally accepted. Others, were more accusing. One of these, Towns [1939], claimed that mandatory confirmation procedures would encourage the public to view the examination of accounts receivable as a guarantee of that number. Towns also added that mandatory confirmations would increase cost and time on engagement. Bacas [May, 1939] also disagreed with the SEC. He recommended use of the confirmation procedure, but only in cases when the auditor doubted amounts in subsidiary ledgers. He added that there was no need to perform the procedure if the auditor found the procedure unnecessary.

In a January 1941 editorial, Carby, the Editor of the Journal of Accountancy, side-stepped the issue. He noted that the Commission's report recommended the extension of auditing procedures, yet refrained from a detailed prescription of procedures to be followed. However, a reading of ASR #19, finds these procedures specifically

enumerated. Carby seems to be writing his editorial to illustrate that the SEC and the public had great confidence in the accounting profession. He implies this by stating that the SEC allowed the accounting profession to develop their own rules. In retrospect, a review of the hearings indicates that the SEC was explicit in their recommended procedures and appeared to be giving the accounting profession no choice. In 1942, the AICPA issued SAP #12 which sided with the SEC and made the confirmation procedure mandatory [AICPA, 1984].

The 1951 Codification continued the controversy surrounding confirmations. Newman [1953] proposed that the Codification of Statements on Auditing Procedure [1951] weakened the need for confirmations. Newman claims that the codification, by allowing unqualified opinions to be associated with unconfirmed receivables, constituted a change in substance. Newman posits that ASR #19 singled out "external" auditing procedures as being more important than internal ones. He stated that such an emphasis could hide certain major fraud schemes.[1] In 1974 SAS #2 formally removed the 1942 requirement.

In 1991, the Auditing Standards Board issued Statement on Auditing Standard No. 67 [SAS 67]. SAS 67 directly discusses certain factors that affect confirmation

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[1] Newman described a scheme remarkably close to the Equity Funding case.

reliability as a form of evidence. Included in these are the type of assertion addressed, the form of the confirmation request, prior experience on the audit, and the intended respondent, among others. SAS 67 does not address the extent or timing of the confirmation procedure. Instead, SAS 67 directly defers these questions to the audit risk statement [SAS 47].

Some dissenting members of the Accounting Standards Board[2] state that the overall purpose of SAS 67 is to reduce reliance on the confirmation procedure [SAS 67, 1991]. Indeed, SAS 67 clearly enumerates three situations when mandatory confirmations are no longer needed; (1) when accounts receivables are immaterial, (2) when the use of confirmation would be ineffective or response rates are low and (3) when audit risk and evidence supporting that risk is low. The bulk of SAS 67 however, involves cases when confirmations should be used. Critics [Caster 1991] and dissenting board members [see SAS 67; paragraph 36 for specific criticisms] claim that this overemphasis may be increasing reliance instead of decreasing it.

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[2] Messrs. Harden and Pallais qualified their assents by stating that paragraphs 34 and 35 inappropriately usurp auditor judgment. These paragraphs discuss the quality of the accounts receivable confirmation as audit evidence and boldly state that the confirmation should be used in most cases. The members state that these paragraphs almost require auditors to confirm receivables and disencourage them to use their own judgment.

Lately, the professional community has expressed concern about the degree of confidence in the confirmation procedure. Caster [1992] reports that auditors have long suspected confirmation evidence to be biased. He cites a Canadian Institute of Chartered Accountants (CICA) 1975 study as explaining the danger of relying upon the confirmation procedure. The danger occurs when the auditor uses the technique "...just to conform with professional standards and not to add audit assurance". Caster specifically states that actual reliability should be low "...due to the respondent apathy, reporting biases (reporting more overstating errors than understating ones) and say-yes behavior (when customers confirm balances without verifying the amount against their records)".

Additional professional concerns [Hall and Renner 1988; 1991] identify reliance on confirmations as a lesson that auditors should learn from litigation. The authors imply that auditors too often rely on routine audit steps that dull "...inquisitiveness and become a trap for the unwary". The authors state specific cases in which the auditors requested and received confirmations, only to find out later that these same customers disclaimed obligation. Supposedly, the auditors placed too much confidence in the procedure and didn't notice that they had mailed confirmations to an inappropriate level in the recipient's organization. Other auditors have been guilty of using the

confirmation procedure as the sole support for a particular assertion. In a later article, Hall and Renner [June, 1991] blame the tendency to make such mistakes on "auditing mechanically". Their claim is that the audit is becoming more structured as self-regulation and standards increase. Hall and Renner [1991] also state that audit structure and increased documentation contribute to auditor complacency.

Reliability Articles

Several research studies concerning reliability of confirmations were conducted before the Equity Funding case [Davis et. al, 1967; Sauls 1972; Hubbard 1972; and Warren 1975]. Warren [1975] summarized findings of these studies by stating that confirmation reliability is dependent on the willingness of recipients to comply with confirmation requests. Other significant factors affecting reliability are the type of confirmation, type of account confirmed, direction of the misstatement (overstated or understated), size of the account, magnitude of the misstatement and type of account holder. Of the studies listed above, Hubbard [1972] provided the only accounts receivable study. The other studies involved deposits [Sauls 1971; Davis et. al., 1967] and loan accounts [Sauls 1972; Warren 1975].

Caster [1990] extended Hubbard's [1972] work on accounts receivable confirmations by using many of the variables cited in the Warren summary [1975] to predict whether seeded errors in a client account receivable data

bank would be detected. He found a detection rate of only 47% and an overall response rate of 68.6%. Hubbard, et. al. [1972] reported a similar detection rate of 46.5% and a slightly higher overall response rate. Caster concluded that confirmations are not very reliable and do not provide adequate evidence to support the existence assertion. A CICA [1975] study supports Caster by stating that anything less than 100% confirmation of the sample is unacceptable.

The field studies listed above used error seeded client data banks so that a known detection rate could be calculated. The authors' findings imply that confirmation procedures are unreliable, yet failed to ask for a judgment concerning that reliability or confidence in that judgment. Possibly, auditors are aware of low reliability rates, yet still use the procedure and adjust or compensate by adding other procedures or increasing sample size.

In conclusion, the ideas of too much reliance on the results of the confirmation procedure and too much confidence in that judgment have been developing for some time. Given the current interest in subject, examination of the factors associated with this alleged high reliance and high confidence levels seems warranted as a first step in determining the possible remedies.

CHAPTER III

THEORY DEVELOPMENT AND HYPOTHESES

Typically, auditors document information concerning the audit of accounts receivable in formal workprograms and workpapers. Other information, such as past experience with the procedure, typical response rates, and frequency of use of alternate procedures may be stored in memory alone. While this information may be indirectly integrated by use of alternate workprogram procedures, formal documentation is rare.

As stated in the introduction section, much has been written concerning over-reliance on results of the confirmation procedure. To assess whether auditor's recognize this over-reliance, an experimental design must capture elements of judgment. This experiment attempts to capture at least three of these in the form of (1) knowledge of the outcomes of the procedures, (2) past experience with the accounts receivable audits, and (3) adequate recall of the accounts receivable audit procedures.

Knowledge of Outcomes of the Procedures

Prior research related to knowledge of outcomes of procedures includes that by Weber [1980] and Frederick [1991]. Frederick [1991, 1986] theorizes that auditors are

capable of using both a schematic and taxonomic technique to store auditing information. In this context, Frederick describes a schematic technique as one that provides for an organization of typical activities through use of a temporal or spatial structure. Common examples include such schemas as "going to a restaurant" or "ordering from the menu" [Mandler 1979]. Alternatively, Frederick [1986] describes a taxonomic organization as one that places emphasis on categorical classifications. In general, a taxonomic organization is hierarchical wherein the locations of categories are interconnected based on class inclusion relations [Frederick 1986]. An example includes organizing a menu in terms of appetizers, main entrees', and desserts. In this example pecan pie would be categorically classified as a dessert.

Frederick hypothesizes that auditors are capable of organizing information taxonomically and schematically and that some auditors prefer one form of organization over the other. He also posits that differences in organization styles correlate with differences in recall and judgment. The following discussion extends these memory forms and their applicability to this research.

Schematic Memory Forms

Frederick [1991] and Mandler [1979] describe a schematic structure as one in which the parts are spatially or temporally organized. Frederick [1991] adds that

schematic representations provide stereotyped descriptions concerning typical events, or activities like that of "performing a surprise audit on cash". These descriptions imply that primary elements of a schema include a spatial or temporal organization of a stereotyped description of an event. Frederick [1991] places these elements in an accounting context by developing schemas for temporal flows of transactions (such as typical procedures included in the cash receipts cycle).

Frederick provides evidence that some auditors understand auditing tasks as schemas. Operationally, this occurs when the auditor perceives the task as a typical activity. In the context of this research, the audit of accounts receivable could be considered as one of these typical activities. Herein, the accounts are represented as providing similar information across clients in the form of customer accounts, age of balances, and estimates of uncollectibles. Additionally, standard audit workprograms are considered to provide a somewhat temporal representation of familiar procedures wherein some procedures are usually performed before other procedures. All of this may encourage the auditor to view the task as stereotypical and routine.

Examples of standard workprograms found in the AICPA Audit and Accounting Manual, auditing texts, and individual CPA firm standard workprograms illustrate that accounts

receivable audit workprograms are highly similar. Thus, a conclusion can be drawn that normal accounts receivable workprograms contain temporal, stereotypical, and repetitious elements that make up a schema. A diagram of a normal accounts receivable auditing schema is found in Diagram #1 of Appendix A.

Blaser [1978] documents non-auditing evidence that repetition of judgments increases confidence levels even when the judgment varies widely. If accounts receivable judgments are considered by the auditor to be routine, repetition of those judgments may increase confidence levels. Problems created by increased confidence levels include a lack of recognition of procedural ineffectiveness. In other words, the auditor, by understanding the task as routine and repetitious, may block out problems and alternate procedures.

A typical accounts receivable judgment that might capture these problems includes the assessment of reliability of the accounts receivable confirmations received and the effectiveness of results of the accounts receivable confirmation in satisfying the different client assertions. SAS 67 encourages both the use of confirmations and a related reliability assessment in all but a few accounts receivable audit situations. From this discussion and Blasers' work, it follows that if the judgment is

considered to be repetitious, then confidence in the judgment may be high.

Taxonomic Organization

Frederick [1991] and Rabinowitz and Mandler, [1983] define a taxonomic organization as a hierarchical structure in which the locations of categories interconnect based on class membership and similarity relationships among class members. Frederick [1991] suggests an accounting example whereby internal controls are grouped by objective (such as proper recording or segregation of duties) rather than cycle (such as cash receipts, purchasing, etc.). He states that a primary element of a taxonomic organization is the inclusion of some type of categorical organization.

Weber [1980] and Frederick [1991] provide evidence that some auditors organize and understand auditing tasks categorically. In an auditing setting, this would occur when the auditor uses financial statement assertions as auditing categories. As such, the specific assertions (existence, completeness, rights and obligations, valuation, and presentation and disclosure) provide category labels for procedures underlying each (See Diagram #2 in Appendix A).

This type of organization is not necessarily documented in the workprograms. Additionally, examples of specific workprograms in textbooks, the AICPA Audit Manual, and specific firm manuals more often use a balance sheet account approach instead of an assertion approach. Regardless, it

is common for some auditors to understand the auditing process by assertion. First year auditing texts, training courses, and the AICPA Audit Manual all discuss the assertions and illustrate which procedures provide necessary evidence to answer each.

The same audit judgments (the assessment of reliability of accounts receivable confirmations and their applicability to satisfying the separate assertions) are applicable to both a schematic and taxonomic organization. However, perception of the task may be dissimilar under the two forms. The repetition present in the schematic form may disappear under the taxonomic form causing differences in understanding results of the task. Blaser [1978] provides non-auditing evidence of this by finding that differences in confidence levels vary according to available information. If the auditor organizes or remembers the auditing process categorically (by assertion), the procedures may appear less repetitious and stereotypical. As a result, the compounding effect of increased confidence levels associated with repetitious decision making should disappear. Consequently, it seems likely that the auditor will express a lesser degree of confidence in judgments made.

The following hypothesis[3], will be tested to determine if auditors exhibit high confidence in an account's

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[3] All hypotheses will be stated in the alternate form.

receivable confirmation reliability judgment when the task is represented as a schema as compared to when the task is represented by assertion (taxonomic).

> H1: Auditors representing the accounts receivable workprograms as schemas (schematic) will express a higher degree of confidence in their judgment than auditors representing the accounts receivable task by assertion (taxonomic).

Thinking about the audit of accounts receivable in terms of different assertions may create additional differences in confidence levels. Auditing texts illustrate that confirmations provide both primary and secondary sources of evidence for different audit assertions. The AICPA adds that auditors should place significant reliance on tests considered as primary sources of evidence [AICPA 1984]. The AICPA lists accounts receivable confirmations as an example of such a primary source of evidence for the satisfaction of the existence assertion. Secondary sources of evidence for satisfaction of the existence assertion include examining credit files and shipping documents.

Alternatively, the AICPA stresses that the auditor should place lower reliance on tests providing secondary sources of evidence. Using the completeness assertion as an example, auditors would use cut-off procedures as a primary source of evidence and confirmations as a secondary source. For the valuation assertion, auditors would use collection

reviews, agings and reviews of current credit files as primary sources, and confirmations as secondary sources.

These examples illustrate that the confirmation procedure is more important when used as a primary source of evidence. Additionally, the auditor should place more reliance on the confirmation procedure when it is used to satisfy the existence assertion than when used to satisfy other assertions. At the same time, it is possible that confidence in the reliability decision may differ. Rosch [1978] provides non-auditing evidence of this. He finds that it is common for us to agree on characteristics of items we perceive as important, but that this degree of consensus decreases as our perception of importance decreases. This discussion leads to the following hypothesis:

> H2: Auditors representing the accounts receivable task by assertion (taxonomic) will express a higher degree of confidence in the confirmation procedure for judgments made as to satisfaction of the existence assertion than for judgments made for satisfaction of the valuation assertion and rights and obligations assertion.

Experience and the Representation of Knowledge

Pincus [1991] indicates that experience is related to confidence in audit settings. Denny and Ziobrowski [1972], in non-accounting research add additional evidence. They find that low experienced participants (children) and high

experienced participants (college students) organize and understand information differently. They, like Weber [1980], focus on clustering of similar thoughts and find that when age and experience is low, participants cluster on complementary criteria. As age and experience increase, participants cluster on similarity criteria. They theorize that this change comes about from formal education and experience.

Einhorn [1974] extends thought clustering into the context of expert judgment. He states that criteria indicative of expert judgment include (1) clustering variables in similar ways (2) producing reliable judgments across tasks (intrajudge reliability) and (3) weighting and combining information in similar ways. Alba and Hutchinson [1987] add other criteria including repetition of the task and the ability to isolate important information. Alba and Hutchinson [1987] also add that remembering increases as expertise increases.

The accounting literature to date has struggled with their own definition of expertise. The controversy centers around the necessary aspects and criteria that make up an accounting or auditing expert and whether or not these criteria can be imported from other fields. As such, given the current state of the accounting literature, this experiment will assume that experience is a necessary, but not sufficient condition for expertise. A short summary of

some of the accounting literature applicable to this position follows.

Pincus [1991] implies that experienced auditors may understand the accounts receivable audit task differently than inexperienced auditors. Additionally, some researchers [Johnson 1988; Alba and Hutchinson 1987] propose that experienced auditors make better decisions. Kahneman and Tversky [1979] explain these better decisions by stating that experience leads to learning effects and more experience with errors.

Findings regarding the reliability[4] of the confirmation procedure [Warren [1975]; Caster [1990]] and related errors lead us to speculate that experienced auditors as compared to inexperienced ones, will have a greater understanding of the frequency of errors associated with the confirmation procedure. As Alba and Hutchinson [1987] imply, in this case, more experienced auditors would be able to remember more problems associated with the confirmation procedure. Thus it follows that experienced auditors should provide lower reliability judgments regarding the received confirmations.

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[4] Reliability of the evidence derives its importance from the third standard of fieldwork which states that evidence should be both sufficient and competent to afford a basis for an opinion regarding the financial statements. In this research, reliability of confirmations is defined as the probability that the positive confirmation received by the auditor reflects a true correct value owed to the client at year end.

Additionally, the work by Blaser [1978] indicates that experience may be associated with increases in confidence in judgments. This discussion leads to the following hypothesis:

> H3: Experienced auditors will produce lower reliability judgments associated with accounts receivable confirmations than inexperienced auditors and have more confidence in their judgments than inexperienced auditors.

Differences in experienced vs. inexperienced auditors may also be found in recall ability. Frederick [1991] and Choo and Trotman [1991] add that these differences are a function of a better developed memory. Einhorn [1974] and Alba and Hutchinson [1987] predict that experts have better recall ability. Frederick [1986] explains this same phenomenon as a byproduct of the ability to use both schematic and taxonomic memory forms to store each experience. Supposedly, using both forms results in a larger, more efficient memory base.

Others, including Rabinowitz and Mandler [1983] and Denney and Ziobrowski [1972] extend these findings into the area of preferences among memory organizations. Denney and Ziobrowski [1972] posit that the inexperienced are more responsive to schematic organizations, whereas the experienced are more responsive to taxonomic organizations. They explain that taxonomic classification is a developmental endpoint representing typical or "ideal adult

functioning." As such, it is possible that the experienced auditor as compared to the inexperienced auditor more effectively organizes and recalls data from taxonomic storage. Khan and Paivio [1988] criticizes Rabinowitz and Mandler [1983]. Khan and Paivio [1988] claim that Rabinowitz and Mandler's [1983] schema list was easier to remember than their category list because organizing labels were present in the former but not the latter. Their replication indicated that when the lists were equated, recall by participants was equivalent.

Ashton [1991], provides words of caution regarding the idea that significant differences in recall ability are related to experience. She found that auditor experience (how many times an auditor actually performs a specific task) is limited. She proposes that perhaps, the most experienced auditors have too limited experience for differences in taxonomic versus schematic retrieval to appear. Ashton [1991] and Alba and Hutchinson [1987] imply that repetition of a task is an important measure of experience.

Since the confirmation task is simple, performed by first year auditors repetitively, and reviewed by experienced auditors repetitively, possibly this is one auditing example where high specific task experience can be found. This discussion leads to the following hypothesis.

H4: Experienced auditors will be able to recall more accounts receivable substantive tests and have more confidence in their accounts receivable confirmation judgments associated with both taxonomic and schematic organizations than inexperienced auditors.

Interference and the Representation of Knowledge

Moser [1989] posits that judgment can be systematically influenced by the effects of output interference. Output interference describes the idea that your first thoughts will interfere or temporarily block later thoughts. Moser [1989] operationalized output interference by asking participants to generate pro vs. con reasons as to why they would invest in a security. He then asked participants to provide opposite reasons (con vs. pro). He found that interference and judgment was influenced by a lack of complete recall. Moser attempted to mitigate this interference by providing participants with accounting data. He hypothesized that accounting data contained cues and information that would facilitate remembering of temporarily forgotten data.

Operationalization of the mitigation portion of Moser's study was problematic. Some participants received the financial statement information as cues, while others received only a company name. As such, some participants received more cues than others. Mosers' results indicated that the presence of accounting data did slightly reduce interference, but had limited effect on judgment.

Criticisms of Moser's work include the argument that since cues inhibit recall, Moser's results may have illustrated that he was testing cues, rather than the contribution of accounting data. Additionally, Mayper et. al. [1991] reports that Moser's results may be situation specific in that the results were found in a context in which subjects generated the arguments. He explains that it is unclear whether these same effects can be expected when auditors simply follow a work program.

The overall implications of Moser's research are unclear, but specific elements may relate to this experiment. It is very likely that auditor's will choose to use confirmations as part of field work supporting accounts receivable. This choice may prohibit recognition of potential problems by way of output interference. Indirectly, this choice may also influence confidence levels. If this choice is repeated, this may indirectly affect confidence.

Additionally, when asked to recall all accounts receivable auditing procedures, the auditor may recall the confirmation procedure first (in the primacy position). Moser indicates that such a recall creates interference through a temporary inability to recall other tests. Moser's work also implies that this initial recall, by eliminating additional recall, temporarily results in higher confidence levels.

Recall Position

Other differences have been noted in recall of data stored under schematic and taxonomic structures. Frederick [1986; 1991] posits that auditors' ability to retrieve whole data sets is more effective when schematic memory is activated. Frederick [1991] and Mandler [1979] explain this by stating that since decreases in output interference relate to memory structure, schemas should be more easily recalled due to their story structure. As stated earlier, Khan and Paivio [1988] in a replication of Rabinowitz and Mandler [1983] refute the claim that schematic memory provides a richer set of retrieval cues and results in better recall.

Frederick however, extended the idea that the schematic form produces a richer set of retrieval cues, by hypothesizing that output interference is a condition of taxonomic memory only. Experimentally, Frederick [1991] found mixed results in that output interference was present under both memory forms, but did decrease under the schematic form. He concluded that auditors prefer to schematically organize knowledge and probably use this schema to "guide" their work much like a workprogram guides operationalization of audit procedures. On the other hand, he also posits that auditor "findings" from this schema guided work may be stored taxonomically.

Work by Mandler [1979] indicates that it is probable that Frederick's hypotheses were too strong in that output interference is expected to decrease under the schematic form, but not be eliminated. Other criticisms suggest that Frederick's operationalization of memory structure confused elements from both taxonomic and schematic forms. Additionally, the statistical test [Accelerated Ratio of Clustering] used by Frederick [1986; 1991] to determine the presence of schematic and taxonomic organization is designed to test for clustering and is better used as a test of categorical (taxonomic) storage only.

Additionally, some researchers illustrate that differences in decision making may be related to the differences in recall ability associated with schematic and taxonomic structures [Mandler 1979; Kinstch 1977; Galambos and Rips 1982; Barsolou and Sewell 1985; Rosch and Lloyd 1978; and Frederick 1986]. These researchers [see also Choo and Trotman and Weber 1980] state that organization structure facilitate recall and recall order. As such, different recall positions are expected to associate with different organization structures and influence decision making. This framework allows experimental testing of memory organization preference. The elements needed to perform such a test are described below.

Order of Importance Theory

Anderson [1990] states that strong items[5] in memory are usually recalled first and that recall follows an order of importance. This implies that strong items highly correlate with important items. Galambos and Rips [1982] operationalize importance with a concept they call "centrality". This concept closely relates to elements such as distinctiveness within a larger event, indispensability in carrying out the event, or by its relatedness to the event's goal.

Importance in an accounts receivable study might correlate with the relatedness to the event's goal or indispensability in carrying out the event. If the event is to audit accounts receivable, and the goal is to satisfy the existence assertion, then the confirmation procedure may be considered as most important. Alternatively, if the goal is to satisfy the valuation or rights and obligation assertions, then the confirmation procedure should be considered less important.

These examples illustrate, that there may be situations wherein one auditor might have different perceptions of the importance of the confirmation procedure. Regardless, participant assessed importance should directly correlate

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[5] Rosch and Lloyd, 1984 parallel strong items with prototypical items.

with the participants perception of the accounts receivable audit process.

Fuzzy Trace Theory

Brainerd and Reyna [1990] provide research that argue against the idea that strong items are recalled/output first. Their research demonstrates that important items are rarely output first. Specifically, weaker (more unimportant items) items supposedly occupy both the primacy and recency recall order positions, while stronger items occupy the intermediate position. Technically, this gives the information string a weaker-stronger-weaker ordering instead of a more logical stronger-weaker-weaker ordering [Brainerd and Reyna 1990].

Brainerd and Reyna [1990] explain this weaker-stronger-weaker (w-s-w) ordering as a cognitive triage effect arising from a theory they name fuzzy-trace theory. In actuality this theory is just a refinement of the output interference theory. This theory portrays recall as a dynamic system in which three variables (memory strength, memory activation, and output interference) are major influences requiring balance to maximize recall. The word 'triage' is used to illustrate that the most difficult cases will be given the most attention. Brainerd, Reyna, et. al. [1990] use the triage relationship to show that recall theoretically duplicates an efficient process by managing resources

through output order.[6] Part of this management predicts that the most difficult items in recall (i.e. the weaker items), will be output first [Brainerd, Reyna, Howe, and Kevershan 1990] during times when interference from words or items previously recalled is low. As blockage occurs, interference becomes high (i.e. there is competition among items waiting to be read out) and the recall order switches to well known and easier recalled items (i.e. the most important, the most frequent or the most atypical). This switching provides a break, allowing interference to dissipate and leaving the mind free to attempt output of weaker items. All in all, the theory is consistent with the importance of memory strength and its relationship to recall accuracy [Brainerd, Reyna, Howe, and Kevershan 1990] but argues against the idea that output order should match memory strength, given interference. Words of caution should be added however. Brainerd and Reyna's work only involved a recall of a list of words. Additionally, the experimenter rather than the participant, weighted whether a word had strong or weak trace. Possibly participants and experimenters have different perceptions of the importance of items. Thus it is unclear if these findings can be

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[6] Anderson [1963] would imply that this is rational optimizing behavior.

translated into a situation wherein subjects are asked to recall procedures.

Nonetheless, Brainerd and Reyna's research could add important elements in our understanding of high confidence levels and output interference. If confirmations are considered as highly important, the idea that they may be output first, parallels Moser's [1989] output interference theory. Additionally, if these important items occupy the primacy position they may prevent the auditor from questioning the procedure or encouraging alternate tests.

Alternatively, Brainerd and Reyna would posit that important factors concerning the audit of accounts receivable are not necessarily recalled first. Under this theory, output interference is better managed when the recall string is w-s-w. This theory, allows us to speculate as to whether differences in recall strings correlate with differences in confidence levels. If differences are found, then possibly some groups of auditors manage output interference more efficiently.

Using Recall Order to Determine Type of Storage

Additionally, recall strings can be used to provide more information. Mandler [1979] suggests that schematic recall depends on the story. Frederick [1986; 1991] adds, that the schematic form is subject to lesser amounts of output interference. Given this statement and Brainerd and Reyna's suggestion that a Weak-Strong-Weak recall string is

associated with better managed interference, it follows that the schematic form should produce the Weak-Strong-Weak recall string associated with better managed interference. Alternatively, Rosch and Lloyd [1978] imply that taxonomic storage should produce recall in order of importance. Frederick [1986] adds, that this form is also subject to greater amounts of output interference. These ideas suggest that the taxonomic form will produce a recall string of Strong-Weak.

Given Frederick's findings that some auditors prefer one type of memory organization over others, the recall string provides the basis for such a test. Other elements of the test include experience effects. Denney and Ziobrowski [1972] state that as experience increases, the ability to use the taxonomic form also increases. They imply that inexperienced subjects prefer to use the schematic form. Frederick [1991] states that experienced auditors use both.

The accounts receivable confirmation procedure can be considered as a very common procedure. As such, it is likely that auditors will have sufficient experience with performing the procedure. It follows, that auditors possessing the most experience will be better able to use the taxonomic form. This discussion leads to the following hypotheses.

H5: Experienced auditors will use both types of storage, while inexperienced auditors will use only schematic storage.

This hypothesis is similar to that of Frederick [1986; 1991]. Specifically, he tested whether experts would retrieve more from a schematic organization than a taxonomic organization. Additionally, he added that novices would retrieve equally well from schematic and taxonomic organizations. His findings revealed that in a control group, participants did not prefer one organization type over the other. Additionally, in the treatment groups he found that both experts and novices order their output to a greater extent in the schema condition. His results also revealed that experienced auditors recalled more steps than inexperienced auditors.

Frederick [1991] also used the recall results and the theory that experienced auditors use schematic storage to indicate that the additional recall implied that experienced auditors use schematic storage. Criticisms of Frederick's experiment and results include that output interference is likely to present in both schematic and taxonomic conditions and that students are not appropriate surrogates for inexperienced auditors. It is unlikely that students would recall as many procedures as inexperienced or experienced auditors.

Hopefully, these hypothesis will help clear previous mixed results. As such, these hypotheses provide an important first step for the understanding of differences in memory structure and how these differences relate to ineffective recall, influenced judgments, and high confidence in those judgments. Hopefully, findings from this study can be used to predict and encourage better judgments by way of different workprogram design and memory techniques.

CHAPTER IV

RESEARCH METHODOLOGY

A summary of the aforementioned hypotheses is provided below in Table 1. An analysis of the hypotheses (H1, H2, H3) indicates that the experimental design should contain at least two treatments (schematic and taxonomic) and capture information for an experience variable (for H3, H4, and H5), a recall variable (H4, and H5), a reliability estimate (H3), confidence in judgment (H3) and confidence in the accounts receivable confirmation procedure (H1, H2).

Table 1 - Summary of Hypotheses

H1: Auditors representing the accounts receivable workprograms as schemas (schematic) will express a higher degree of confidence in their judgment than auditors representing the accounts receivable task by assertion (taxonomic).
H2: Auditors representing the accounts receivable task by assertion (taxonomic) will express a higher degree of confidence in the confirmation procedure for judgments made as to satisfaction of the existence assertion than for judgments made for satisfaction of the valuation assertion and rights and obligations assertion.
H3: Experienced auditors will produce lower reliability judgments associated with accounts receivable confirmations than inexperienced auditors and have more confidence in their judgments than inexperienced auditors.

H4: Experienced auditors will be able to recall more accounts receivable substantive tests and have more confidence in their accounts receivable confirmation judgments associated with both taxonomic and schematic organizations than inexperienced auditors.
H5: Experienced auditors will use both types of storage, while inexperienced auditors will use only schematic storage.

These hypotheses suggest that a variety of data be collected. A summary of the data needs, and respective variables to be used are listed below in Table 2. The variables are marked in terms of their dependent or independent status.

Table 2 - Data Needs

Hypothesis	Data to be collected	Variables
H1	Confidence in judgments made by taxonomically treated and schematically treated groups concerning accounts receivable confirmations.	Q4 - Dependent GROUPT - Indep. GROUPS - Indep.
H2	Confidence in judgments made by Taxonomic auditors concerning the existence assertion, the rights and obligations assertion, and the valuation assertion.	Q5, Q7 - Dep. GROUPT - Indep. GROUPS - Indep.
H3	Auditor experience, Reliability Judgments associated with accounts receivable confirmations, Confidence in judgments.	REL, C1 - Dep. EXPNUM - Indep.
H4	Number of substantive tests recalled, Auditor experience.	RECALL - Dep. EXPNUM - Indep.
H5	Free recall listing by untreated group, Auditor experience.	Recall Method - Dep. EXPNUM - Indep.

The variables listed in Table 2 are defined in Table 3 and cross referenced to questions and documents contained in the experimental instruments (See Appendix B, C, D). The variables, experimental design and instrument design are described following Table 3.

Table 3 - Variable Description

Variable	Definition	Source
C1,(H3)	Overall Confidence judgment	Sum of Q2, Q4, Q6 Q8, Q10. From Document #3
Q4,(H1)	Confidence in your judgment	Q4 from Document #3
Q5,(H2)	Confidence as to the reliability of confirmations for satisfaction of the existence assertion	Q5 from Document #3
Q7,(H2)	Confidence as to the reliability of confirmations for satisfaction of the valuation assertion	Q7 from Document #3
Q9[7],(H2)	Confidence as to the reliability of confirmations for satisfaction of the rights and obligations assertion	Q9 from Document #3

[7] The use of Q9 was problematic. Table 6 (reported later) reveals that Q9 failed to load onto the same factor as Q5 and Q7. Additionally, Univariate data (reported in Table D.2) revealed that Control Group members answered Q9 in an unpredicted manner. Specifically, answers to Q7 and Q9 should be lower than Q5. This was not the case for the control group. Statistically, the control group answers to Q9 were no lower than control group answers to Q5. As such, Q9 was deleted from any further analysis.

GROUPT (H1, H2, H5)	Taxonomic = 1 Other = 0	Instrument Assignment
GROUPS (H1, H2, H5)	Schema = 1 Other = 0	Instrument Assignment
EXPNUM (H3, H4, H5)	Number of times an auditor has directly participated in an accounts receivable audit	Question #3 Participant Questionnaire
REL (H3)	Reliability estimate concerning the number of reliable responses the auditor expects to receive	Question #3, Document #3.
RECALL (H4)	A count of substantive procedures recalled	Document #6

Research Design

To test the hypotheses, data should be collected from three groups including a taxonomically treated, a schematically treated, and a control group. As such, three instruments were constructed [see Appendix B (Control Group Instrument), C (Schematic Group Instrument), D (Taxonomic Group Instrument)]. Participants were randomly assigned to one of these two treatments [schematic or taxonomic] or to the control group. This random assignment was accomplished by distributing the three test instruments to participants in random order.

Independent Variables

The hypotheses suggest developing three primary independent variables. The first is an Experience variable hereafter referred to as EXPNUM. This variable represents the number of times that the auditor has participated in the audit of accounts receivable. To solicit numerical values for this variable, each participant was asked a question concerning how many times they have been directly involved in the audit of accounts receivable (Question #3 on the Document #4 - Participant Questionnaire). To provide reference points for this answer, the auditor was asked to check the appropriate range of experience (i.e. None, Under 5 times, 5-10 times, 10-20 times, and over 20 times). As such, the minimum value for EXPNUM was coded as zero, while the maximum value for EXPNUM was coded as twenty-one.

Other important independent variables include the type of experimental treatment received by the auditor. Three groups were utilized in this treatment phase. One group [GROUPT] received an instrument designed to elicit taxonomic organization skills. Another group [GROUPS] received an instrument designed to elicit schematic organization skills. The third group received a control instrument. Recipients of the control instrument answered questions without experimenter manipulation. Specifically, the control group instrument did not contain a substantive test portion of the audit workprogram designed in a temporal (schematic) or

categorical (taxonomic) order [compare Document #1 in Appendix B, C, and D].

The taxonomic group treatment (Document #1 of Appendix D) differed from the schematic group treatment (Document #1 of Appendix C). Specifically the taxonomic group received an instrument that included a substantive test portion of the audit workprogram organized by assertion (Document #1). Assertion ordering represents categorical ordering which is implicit in taxonomic organization. The schematic group received an instrument that included a substantive test portion of the audit workprogram organized temporally (Document #1). Temporal ordering represents sequence ordering which is implicit in schematic organization.

The three groups are represented in the data by two independent dichotomous variables; GROUPT and GROUPS. Taxonomic treatment is coded as follows: GROUPT = 1, GROUPS = 0. Schematic treatment is coded as follows: GROUPT = 0, GROUPS = 1. Members of the control group are coded as follows: GROUPT = 0, GROUPS = 0.

Dependent Variables

Tests of the hypotheses depend upon development of several dependent variables. The first of these is an overall confidence score, hereafter referred to as C1. This confidence score is designed to measure the amount of confidence that auditors place in their judgments relating to the use of accounts receivable confirmations. To elicit

these confidence scores the auditors are asked to make five simple audit judgments associated with accounts receivable confirmations (Questions 1, 3, 5, 7, 9 on Document #3), and to express their confidence in the accuracy of those judgments (Questions 2, 4, 6, 8, 10 on Document #3). Answers to the five confidence questions are summed to form a confidence score [C1], which may be used as a surrogate for overall confidence in judgment.

Additionally, Question #4 (Q4) may be separated from the overall confidence score (C1) to provide a surrogate for confidence in their judgment relating to the reliability of the accounts receivable confirmation procedure. Hence, Q4 is subset of C1.

Questions 5, 7, and 9 represent judgments as to the percentage weight that the accounts receivable confirmation procedure should be given for satisfaction of the existence (Q5), valuation (Q7), and rights and obligations (Q9) assertions. These questions provide answers that serve as surrogates for the confidence as to the reliability of confirmations as they relate to the separate assertions. As described earlier (see footnote #7), Q9 was deleted from the analysis.

Other dependent variables include the auditors' estimate regarding the percentage of reliable (hereafter referred to as REL) confirmation responses that s/he expects to receive on an engagement such as the one represented by

Document #2. A reliable response is defined in the instrument [see Question #3 on Document #3] as one where the customer provides a true correct value of the amount owed as of the client year end. Data for this variable is elicited with question number three (on document #3).

Other dependent variables include the number of substantive tests recalled (hereafter referred to as RECALL). This data was solicited in Document #6 from each of the participants. Here, the participants were asked to recall as many substantive tests related to an accounts receivable audit as they could. These were counted by the experimenter to provide a numerical score for the RECALL variable.

The substantive tests recalled on Document #6 also provides data to be used to determine the RECALL METHOD used by inexperienced and experienced participants. Data from Document #6 is provided by each of the three groups. Recall data provided by the Control group will be used to determine the recall method used. Recall data provided by the Schema and Taxonomic groups serve as manipulation checks as to the effectiveness of the treatments.

Other demographic data is also collected in the instrument. The purpose of this data is to provide a description of the participants and a source for testing whether or not the experimental groups represent the same population.

Instrument Design

The need for these different variables, along with descriptive demographic data influenced the design of the three instruments. Complete copies of experimental instruments for the control, taxonomic treatment, and schematic treatment group are contained in Appendix B, C, and D respectively. These were pilot tested before actual experimentation began. Diagram 3 (Appendix A) flow charts the procedures documented in these instruments. The experimental purpose of each group and procedure is discussed below.

Instrument for Control Group

The purpose of the Control Group is to elicit untreated accounts receivable confirmation reliability and confidence judgments along with uncued recall of standard substantive accounts receivable auditing procedures. Another purpose is to elicit a ranking by order of importance of participant provided procedures. The untreated reliability judgments and confidence levels serve as a basis for comparison between control and treatment groups. The uncued recall serve as a basis for determining whether a participant (experienced vs. inexperienced) was predisposed to recall in a taxonomic versus a schematic fashion. The untreated importance ranking serve as a basis for determining whether subjects recall important procedures in the primacy, intermediate, or recency position.

The instrument for the Control Group is found in Appendix B. The instrument begins with a sentence describing the purpose of the substantive test portion of audit workprogram. The sentence uses very general language and is not designed to cue or suggest a schematic or taxonomic organization. Next, the instrument contains an audit situation concerning the confirmation of accounts receivable. This situation (Document #2) is presented to provide a point of reference to the participant as to the type and relative risk of the client described in this instrument.

As presented in Appendix B, this printed audit situation (Document #2) is followed by a sample accounts receivable confirmation. Providing this sample helps reinforce the idea that the instrument is using positive form confirmations. Several questions (found on Document #3) follow the confirmation. These solicit the number of confirmation responses that participants expect to receive, their confidence in that estimate, the number of reliable responses [REL] that participants expect to receive and their confidence in that estimate. Additionally, participants are asked to provide estimates of the percentage weight that they would assign to confirmation procedures and other procedures if they were attempting to satisfy the existence [Q5], valuation [Q7], or rights and obligations [Q9] assertions. As stated earlier, all answers

to confidence questions [Q2, Q4, Q6, Q8, Q10] are summed to form an estimate for C1.

Participants are also asked to recall (on Document #3) the number of problems that they have encountered with the accounts receivable confirmation procedure. This question provides information to be used as a co-variate to determine if remembering problems influenced confidence scores. Next, participants are asked to complete a participant questionnaire (See Document #4) designed to elicit experience levels, education levels, firm size, and other demographic data. Answers to these questions are also used as co-variates.

A distractor task (Document #5) follows. The distractor task asks the auditor to rank several client packages in the framework of an acceptance and continuation of clients. The distractor task serves as a means with which to clear short term memory. This task is more important to the taxonomic and schematic groups than the control group. Participants are then asked to recall (on Document #6), from their own experience, as many substantive procedures for the audit of accounts receivable as they can.

This untreated recall is used to determine the number of substantive tests recalled and whether different types of auditors prefer one type of storage over the other. This recall also provides a participant weighting of the importance of each item recalled. The weighting options are

described as a value of (1) for a step that the participant considers as being very important in fulfilling the audit objective, (2) for a step that the participant considers as being somewhat important in fulfilling the audit objective, or (3) for a step that the participant considers as being unimportant in fulfilling the audit objective.

Instrument for Schema Treatment Group

The purpose of the Schema Treatment Group is to elicit schema treated reliability judgments, confidence levels, and recall associated with accounts receivable confirmations. The schema treated reliability judgments, confidence levels and recall serve as a basis for comparison between control, schema, and taxonomic treatment groups. The recall serves as a basis for assessing the adequacy of the treatment.

To operationalize this treatment, members in the Schema Treatment Group (see the Schema Treatment Instrument in Appendix C) were given an instrument similar to the Control instrument. The Control instrument differed from the Schema Instrument primarily on Document #1. For the control group, Document #1 contained only a short paragraph describing the substantive test portion of the audit workprogram. Alternatively, for the Schema Group, Document #1 contained sixteen substantive tests for the audit of accounts receivable and was approximately one and one-half pages in length. The Schema Treatment Document #1 also contained a different opening paragraph describing the

objective of an audit and the objective of the substantive test portion of the workprogram. This paragraph did not mention financial statement assertions and presented the audit objective as an expression of opinion as to fair presentation of the financial statements.

After reading this paragraph, the participant read the sixteen standard accounts receivable workprogram steps. These steps were presented in the same wording and order as those in the AICPA Audit and Accounting Manual. Since these steps were presented in a routine temporal order (i.e. not by assertion) the workprogram steps were designed as a schema treatment. Participants were asked to read and study these for a few minutes. The remainder of the instrument was identical to that for the control group. These same steps were rearranged on Document #1 by assertion, to facilitate taxonomic treatment.

Instrument for Taxonomic Treatment Group

The purpose of the Taxonomic Treatment Group (see the Taxonomic Treatment Group Instrument in Appendix D) is to elicit reliability judgments, confidence levels and recall associated with accounts receivable confirmations. Another purpose is to elicit a free recall of standard substantive procedures used in the audit of accounts receivable.

The taxonomic instrument uses procedures and language similar to that found in the Control and Schema Treatment. The instrument for the taxonomic group was identical to that

received by the Control and Schema except for Document #1. To operationalize the taxonomic treatment, the first paragraph of Document #1 described the purpose of the substantive test portion of audit workprogram in terms of the five different financial statement assertions. This paragraph was followed by the sixteen identical workprogram steps provided to the schema treatment group, rearranged by assertion.

As such, the paragraph and workprogram steps were designed as a categorical or taxonomic treatment. The remainder of the instrument was identical to that of the control group.

Pilot Testing

Since the instruments were developed by the experimenter, several procedures were followed to improve accuracy. Initially, these instruments were pilot tested to analyze unforeseen weaknesses in either the instrument or experimental design. This pilot study involved two phases and included three auditing professors, and six auditors from a local accounting firm. The auditing professors served as an expert panel and reviewed the instrument primarily for its technical merit and applicability to actual audit situations. They specifically provided input on whether the schematic treatment represented a temporal organization. They also assessed whether each audit step or procedure was classified correctly under each assertion.

Separate interviews were conducted with each faculty member. During the interview, the generalizability of the instrument, problems, and suggestions were discussed. Verbal descriptions of their perception of what was being measured were also discussed. The audit professors also served as technical advisors and specifically addressed whether the temporal organization (as it related to a schematic treatment) was reasonable and whether the categorical/assertion organization (as it related to a taxonomic treatment) was correct. A log was developed containing their comments. Modifications were made where needed.

During the second phase of the pilot study six practitioners, varying from inexperienced to highly experienced, were asked to complete and comment on the instrument. Hence, they served as a second expert group. These auditors were given the instruments in experimental settings. Following completion, each participant was interviewed and a log was kept of their comments. The interview included questions concerning the overall generalizability of the task, problems that the participants may have had in understanding the questions, and overall perception of what was being measured. No major problems were noted during this phase. The instrument was changed to reflect minor suggestions. A completed instrument for all

three groups (control, schematic, and taxonomic) is found in Appendix B, C, and D respectively.

Instrument Analysis - Reliability

The Confidence and Recall variables were analyzed in terms their reliability. Harrell and Wright [1990] and Jaeger [1990] define reliability as the consistency achieved when measurements are made of some phenomenon. They state that the more consistent the results, the higher the reliability of the measurement instrument.

Jaeger [1990] discusses several methods of assessing reliability of measurement including some that indicate consistency of measurement at a given time and others that indicate stability of measurement across a period of time. Jaeger [1990] and Harrell and Wright [1990] state that for laboratory experiments and experiments collecting data on only one occasion (i.e. one site visit for each firm) an internal consistency method such as Cronbach's Alpha is preferable. They explain that Cronbach's Alpha will indicate the degree to which the components of a measurement procedure tend to assess the same underlying variable.

Cronbach's Alpha Procedure

Cronbach's procedure was applied to test reliability of measurement of certain questions (Q1-Q10 from Document #3) from the instrument. These tests resulted in a standardized Cronbach Coefficient Alpha of 0.796501 reported in Table 4.

Table 4
Correlation Analysis - Q1 - Q10
Cronbach Coefficient Alpha

for RAW variables : 0.790691
for STANDARDIZED variables: 0.796501

	Raw Variables		Std. Variables	
Deleted Variable	Correlation with Total	Alpha	Correlation with Total	Alpha
Q1	0.245405	0.792993	0.260051	0.802574
Q2	0.625907	0.751597	0.631965	0.759063
Q3	0.307717	0.788668	0.322549	0.795629
Q4	0.682853	0.745515	0.696484	0.750966
Q5	0.384015	0.781857	0.372823	0.789937
Q6	0.706722	0.738553	0.724187	0.747437
Q7	0.174291	0.807796	0.166727	0.812678
Q8	0.737001	0.737351	0.728034	0.746945
Q9	0.182084	0.819395	0.175164	0.811778
Q10	0.714724	0.739803	0.693736	0.751314

Jaeger [1990] states that any observed score (such as Cronbach Alpha) consists of two parts: a true score and an error component. Jaeger [1990] explains that the reliability of a measure is expressed as an index that takes on values between 0 and 1. Hence, a reliability score of zero means that the observed scores consist entirely of error components, whereas a reliability score of one means that the observed scores consist entirely of true scores. Harrell and Wright [1990] use a minimum Cronbach Alpha value of .60 as a determinant of reliability. In this analysis all observed scores were above the suggested .60 value.

This indicates that the measurements are somewhat reliable and were consistent across subjects.

Instrument Analysis - Validity

Harrell and Wright [1990] state that content validity refers to the extent to which an empirical measurement reflects a specific domain of content. Jaeger [1990] continues that the validity question is difficult to answer and that a definitive conclusion cannot be reached. As such, measures of validity offer only evidence of validity rather than proof.

Kaplan [1963] discusses many methods of assessing validity of measurement in behavioral science. Two of these include using expert human judges, and some sort of multidimensional technique (like the principal factor analysis used in this study). As discussed earlier, in this experiment, expert human judges were used to develop and test the instrument.

Cohen and Cohen [1983] discuss the use of factor analysis to determine if the variables present in the research instrument measure what is intended to be measured. These authors state that the analysis will define a common factor in the factor-analytic sense, in which case the variables could be combined into an index, factor score, or sum. If this is done, the construct that is being measured will be represented with greater reliability and validity.

This type of analysis can also be useful to discriminate as to which variables represent a particular construct.

To begin the principal factor analysis, the raw data was input with the intent of extracting initial factors. It was anticipated that certain variables (questions) would load onto predicted factors. As such, Questions relating to confidence (Q2, Q4, Q6, Q8, and Q10) were expected to load onto a factor that could be described as "overall confidence". Additionally, Questions relating to estimates of weighting (Q5, Q7, Q9) were expected to load onto a factor that could be interpreted as "Confidence in the procedure".

To determine the number of factors, Kim and Mueller [1978] suggest using the criterion of "eigenvalues greater than 1". Initially, the principal factor method produced two eigenvalues greater than 1 (See Table 5). From the initial factor determination, all questions relating to confidence loaded onto the first factor.

Table 5
Eigenvalues for Initial Factor Method:
Principal Factors

Eigenvalues of the Reduced Correlation Matrix:
Total = 15.8712146 Average = 0.83532709

	1	2	3	4
Eigenvalue	4.0309	1.1983	0.5737	0.4215
Difference	2.8326	0.6247	0.1522	0.2282
Proportion	0.6452	0.1918	0.0918	0.0675
Cumulative	0.6452	0.8369	0.9288	0.9962

A Varimax rotation (See Table 6) as suggested by Kim and Mueller [1978] produced a clearer separation of factors. After the varimax rotation, all questions relating to overall confidence loaded onto the first factor (these are noted with an '*' in Table 6). Questions relating to confidence in the procedure (with the exception of Q9) loaded on to the second factor. A later analysis reveals that members of the control group did not respond as expected with regards to Q9. This is probably associated with the failure of Q9 to load on to Factor2.

Table 6
Rotation Method: Varimax

	FACTOR1	FACTOR2
Q8	90 *	8
Q4	85 *	9
Q2	85 *	-3
Q10	84 *	13
Q6	84 *	16
RECALL	31	-8
Q3	28	25
Q1	25	12
Q5	13	70 *
Q7	-6	67 *
Q9	3	47

An interpretation of this rotation implies that overall confidence (Q2, Q4, Q6, Q8, and Q10) and confidence in the accounts receivable procedure (Q5, Q7) were separated by the instrument. This rotation also provides support [according to Jaeger, 1990] for a summation of confidence variables (i.e. Q2, Q4, Q6, Q8, Q10 into C1.).

Limitations of such an analysis are also important. Insofar as the variables and constructs are concerned, Jaeger [1990] and Kim and Mueller [1978] state the existence of a causal structure cannot be proved, but its plausibility can be merely assessed. As such, the factor analysis can only provide evidence of validity.

Proposed Data Analysis

The hypotheses defined earlier will be tested in a variety of ways. Results of these tests will be included in the next chapter.

Initially, demographic data will be analyzed to help describe the overall data base and each of the treatment and control groups. This analysis will be univariate in nature and will be used to determine if there are differences and/or similarities between the groups. A frequency distribution for answers to all questions will be accumulated.

Hypothesis Testing - H1

Hypothesis testing will begin with H1. As stated earlier, the hypothesis posits that auditors representing the accounts receivable workprograms as schemas (GROUPS) will report higher confidence scores (Q4) than auditors representing the accounts receivable task by assertion (taxonomic - GROUPT). Testing this hypothesis requires that confidence scores relating to judgments made about the

reliability of the procedure from both the schematic and taxonomic group be compared.

Cohen and Cohen (1983) state that Hierarchical Analysis is a useful tool for extracting information from a data set such as the one provided by answers to the instruments. Cohen and Cohen [1983] operationalize an Hierarchical Analysis by entering the independent variables into the regression equation in a prespecified order. As each variable is added R^2 increases. This increase and the partial coefficient are monitored at each progressive step. Cohen and Cohen [1983] further explain that likely candidates for causal priority variables are status variables such as age, sex, education etc.

Given the ideas posited in this research, it seems logical that an experience variable (EXPNUM) should be the initial variable. Support for this initial position is gained from the psychology literature [Denny and Ziobrowski 1972; Einhorn 1974; Rabinowitz and Mandler 1983] which implies that experience and expertise in an area may determine the type of storage or mental organization trend. The second variables will be the dummy variables [GROUPT and GROUPS] that indicate the type of treatment given. Thus,

variables in the following regression equation will be tested.[8]

$$C1=\beta_0+\beta_1 EXPNUM+\beta_2 GROUPT+\beta_3 GROUPS+\epsilon$$

H3 (to be discussed later) suggests that EXPNUM will be significant and that the sign will be positive. H1 suggests that GROUPT and GROUPS will produce significant coefficients. H1 also suggests that these significant coefficients will produce a statistically significant increase in R^2 after GROUPT and GROUPS are entered into the equation. To test for differences between the groups, a t test [used by Cohen and Cohen 1983] will be conducted.

Hypothesis Testing - H2

H2 posits that auditors representing the accounts receivable task by assertion will express a higher degree of confidence in judgments made using confirmations for satisfaction of the existence assertion than judgments made using confirmations for satisfaction of the valuation and rights and obligation assertion. Data necessary to test this hypothesis is gathered from answers to Question 5 (the weight that accounts receivable confirmations should be given for satisfaction of the existence assertion) and

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[8] All questions from Document #4 (Participant Questionnaire) will be tested as additional dummy variables in the regression equation. Due to the limited sample size (70), these questions will be tested individually.

Question 7 (the weight that accounts receivable confirmations should be given for satisfaction of the valuation assertion) on Document #3. Answers to Question 9 (the weight that accounts receivable confirmations should be given for satisfaction of the rights and obligations assertion) will also be included for Univariate testing purposes.

The variable Q5 is being used as a surrogate to represent confidence in judgments relating to the existence assertion. The variable Q7 is being used as a surrogate to represent confidence in judgments relating to the valuation assertion. The variable Q9 is being used as a surrogate to represent confidence in judgments relating to the rights and obligations assertion. Given that taxonomically treated auditors should be more aware of these assertions, the taxonomic group (GROUPT) will be of particular interest.

Initially, data for the taxonomic group will be separated from that provided by the schematic and the control groups. Univariate data will be collected for Q5, Q7 and Q9. It is expected that there will be significant differences between Q5 and Q7, and Q5 and Q9. It is expected that responses provided for the Q5 variable will be significantly greater than those provided for the Q7 and Q9 variables. Additionally, univariate data will be collected for the schema and the control group.

Other tests will be also conducted. As mentioned earlier, Q5 (the existence assertion confidence variable) and Q7 (the valuation assertion confidence variable) are subsets of each other and are hence related. Cohen and Cohen [1983] suggest analyzing co-dependent variables by partialing these variables from each other to create a new set whose variables have zero correlations with those in the original set. This type of analysis should remove the correlation and leave only the residual. Thus allowing for a more powerful test that is unclouded by correlations. Cohen and Cohen prescribe a SETCOR[9] [1989] statistical procedure to accomplish this.

To begin such an analysis Q5 and Q7 will be entered into a regression equation as co-dependent variables. Independent variables will remain EXPNUM, GROUPT, and GROUPS. The betas of the independent variables will be tested for significance. The hypothesis suggests that GROUPT will test significant.

Cohen and Cohen [1983] suggest that in order to analyze the effects of taxonomic treatment on the confidence associated with the existence assertion versus the rights

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[9] SETCOR is the trademark name for a statistical package written by Jacob Cohen [1989]. The SETCOR procedure is documented in an earlier text by Cohen and Cohen [1983] as well. The procedure begins as a typical multivariate analysis. By removing the correlations between the co-dependent variables, the procedure becomes univariate when each newly constructed dependent variable stands alone.

and obligations and valuation assertions, the Betas for the taxonomic group (GROUPT) should be analyzed. If GROUPT tests significant, the analysis should proceed to the partialing stage wherein Q5 is partialed from Q7 and Q7 is partialed from Q5. At this point, a comparison could be made between partialed Q5 and partialed Q7.

Hypothesis Testing - H3

H3 posits that there are differences in reliability and confidence judgments between experienced and inexperienced auditors. Experienced (Inexperienced) auditors are expected to produce lower (higher) reliability assessments and higher (lower) confidence in judgments than inexperienced auditors.

Two dependent variables are necessary to facilitate this analysis. The first is overall confidence in accounts receivable confirmation judgments (C1). The second is the auditor predicted reliability of the confirmations expected to be received (REL). The independent variable is the number of times that the auditor was engaged in the audit of accounts receivable (EXPNUM).

Since this hypothesis recognizes co-dependent variables, the SETCOR procedure described earlier will be used. Specifically, REL and C1 will be input as co-dependent variables. EXPNUM will be input as an independent variable. This hypothesis does not depend upon group determination, hence the variables GROUPS and GROUPT will not be needed. Initially, the beta of EXPNUM (the

independent variable) will be tested for significance. The hypothesis suggests that EXPNUM will test significant, but the direction of the beta is unclear given that the effect of EXPNUM on C1 and REL may be opposite. For example, as EXPNUM increases C1 should increase as well. However, as EXPNUM increases REL should decrease.

If the EXPNUM beta tests significant, the analysis should proceed to the partialing stage. Here, C1 will be partialed from REL and REL will be partialed from C1 in order for a residual analysis to be performed. For hypothesis testing purposes, the partialed C1 should still be associated with a significant positive EXPNUM beta. The partialed REL should produce a significant negative EXPNUM beta.

Hypothesis Testing - H4

H4 posits that experienced auditors will be able to recall more accounts receivable substantive workprogram steps from both schematic and taxonomic organizations than inexperienced auditors. Variables needed to test this hypothesis are the number of substantive workprogram steps recalled (RECALL) and the number of times that the auditor has participated in the audit of accounts receivable (EXPNUM).

For purposes of this test, EXPNUM will be used as the independent variable and RECALL will be used as the dependent variable in a regression equation. It is

predicted that EXPNUM will be both positive and statistically significant. The RECALL variable is a count of the items recalled by the participant on Document #6.

Hypothesis Testing - H5

H5 posits that experienced auditors use taxonomic and schematic organization, while inexperienced auditors use only schematic organization. The data needed to conduct this test include the substantive accounts receivable workprogram steps recalled on Document #6 by each member of the three groups [taxonomic, schematic, and control]. The number of times that an auditor has participated in the audit of accounts receivable [EXPNUM] will also be included.

Two non-parametric tests will be used to conduct this test. These include an adjusted ratio of clustering [ARC Score] used by Weber [1980] and a Runs up and down test suggested by Gibbons [1985]. A third ad hoc data analysis test matches Brainerd and Reyna's interference theory by analyzing participant importance coding.

Adjusted Ratio of Clustering

To operationalize the Adjusted Ratio of Clustering (ARC) test, the recall string must be recoded according to whether the procedure recalled matched a particular assertion. A coding list, similar to the taxonomic workprogram treatment in Document #1, was constructed by the experimenter. Each procedure listed (recalled) by the participant was coded by the following scale: E - the step

relates to the Existence Assertion, V - the step relates to the Valuation Assertion, R - the step relates to the Rights and Obligation Assertion, P - the step relates to the financial statement Presentation assertion, and C - the step relates to the Completeness assertion. A graduate student provided the coding. If participant recalled items were not included in Document #1, the student conferred with auditing faculty before completion of the coding task. The coding was reviewed by the experimenter. The recoding resulted in an alpha data string similar to the one produced by participant #63.

E C V V E C R

To statistically test the presence of clustering (or evidence of taxonomic organization) Weber [1980] suggests using the measure of category clustering discussed by Roenker, Thompson, and Brown [1971]. Here, an index of clustering called the adjusted ratio of clustering (ARC) is calculated based on the following computation:

$$ARC = \frac{R - E(R)}{\max R - E(R)}$$

where:

R = total number of observed category repetitions

E(R) = Expected number of category repetitions (chance)

max (R)= Maximum possible number of category repetitions

and the related computation is:

$$\max R = N - k$$

where:

N = total number of items recalled

k = number of categories present in the recall protocol

and

$$E(R) = \frac{\sum_i n_i^2}{N} - 1$$

where:

n_i = number of items recalled from category i

N = total number of items recalled.

An example of computation of the ARC score is based upon the recall string provided by participant #63:

E C V V E C R.

In this situation, R=1 and is computed based upon the repetitive V V. If the recall string were E E C V V E C R, then R = 2. A count of the number of letters represented in the recall string (E C V V E C R) = 7, therefore N=7 in this example. A count of the different letters represented in the recall string reveals that E, C, V, and R represent four assertions or k=4. MaxR = N-K or 7-4 = 3. When these values are entered into the E(R) equation a value of .8571 is computed. When E(R) is entered into the ARC equation a value of .0667 is computed.

Interpretation of this ARC score is based upon work by Weber [1980]. Weber [1980] indicates that the ARC measure scores clustering between -1 and +1, where zero represents clustering according to chance. Roenker, Thompson, and Brown [1971] imply that an ARC score reflecting clustering produces an ARC score between +.50 to 1 or -.50 to -1. As such, the case of participant #63 could be interpreted as a lack of clustering or clustering according to chance.

Runs Up and Down

In addition, a Runs Up and Down test suggested by Gibbons [1985] will be used to test the presence of a temporal trend (i.e. evidence of schematic organization). As with the ARC procedure, a graduate student will provide the recoding of the recall string. This recoding will be reviewed by the experimenter.

The recoding will utilize the workprogram presented in the Schema Instrument (Appendix C). Each recalled item will be reassigned the temporal number of the workprogram step listed on the schematically organized workprogram. As such, each procedure listed (recalled) by the participant will be coded by a numerical order. For each completed instrument, the recoding resulted in a numeric data string similar to the following.

4 2 3 15 4 1 11

This recoding represents that participant #63 listed step #4 first, followed by step #2, followed by step #3,

etc. To test whether the participant is recalling in a temporal fashion it is necessary to determine if the numbers are ascending or descending. Gibbons [1985] states that the magnitude of each number should be compared with that of the immediately preceding number. For example, if 4 is compared to 2, a descending trend is noted. To record this comparison as a run, Gibbons suggests recoding this comparison with a + or - sign to reflect the directions of the run. Such a recoding yields a data string for the same participant as follows.

\- + + - - +

This data string represents a run down of length one (when 4 is compared to 2), followed by a run up of length two (when 2 is compared to 3, and 3 is compared to 15), a run down of length two (when 15 is compared to 4, and 1 is compared to 4), and finally, a run up of length one (when 1 is compared to 11). The total number of runs represented is four. The number of observations is 7. When ties are present in the data string, Gibbons [1985] suggests recoding the ties as zeroes and placing them into the + - data string. Since, the zero is neither a plus or a minus, the zero can then effectively be ignored in terms of a run up or down.

A test statistic (V) is used by Gibbons [1985] and is based upon the total number of runs in a sequence. Using this and the number of observations, a "Number of Runs Up

and Down Distribution Table" (a table much like a t distribution) can be consulted to determine the cumulative probability from each extreme to the value of V. The table value is interpreted as a p value.

In a test such as this, the null hypothesis is randomness (i.e. no pattern of sequence). The alternative hypothesis, is that a sequence exists.

Order of Importance Coding

Another test will be utilized to test the order of importance and Fuzzy Trace theory. This test involves no experimenter recoding in that the participant rated each of the steps recalled with an importance score [1, 2, or 3] on Document #6. Thus, Document #6 provided participant coded data similar to that provided by participant #63:

1 2 2 1 2 1 1

In this coding, one (1) represents a step recalled by the participant that s/he considers to be a very important step in fulfilling the audit objective. Two (2) represents a step recalled by the participant that s/he considers to be a somewhat important step in fulfilling the audit objective. Three (3) represents a step recalled by the participant that s/he considers to be an unimportant step in fulfilling the audit objective.

According to the ideas underlying the order of importance theory a code of one (1) should correspond with a strong item. A code of two (2) should correspond with a

weaker item. A code of three (3) should correspond with a weak item. As such a s-w (implying schematic storage) memory string might look like the following:

1 1 1 2 2 2 3 3

Alternatively, a w-s-w (implying taxonomic storage) memory string might look like the following:

2 2 2 1 1 1 3 3

If the order of importance theory is correct, participants will provide a recall string similar to the schematic storage string defined above. If the fuzzy trace theory is correct, a visual inspection of these participant coded recall strings, should match the calculated ARC and Runs up and down test results.

The ARC score, the Runs Up and Down Score, and the Visual inspection of the order of importance will be performed on all three groups. An analysis of the control group by all three tests will help determine which type of storage is preferable among untreated participants. An analysis of the treatments groups by all three tests will serve as a manipulation check to determine whether treatment was effective. A comparison between the visual inspection of the order of importance and the other two non-parametric tests [ARC Score and Runs Up and Down] will determine if the order of importance theory is consistent with results from the Taxonomic and Schematic treatment.

CHAPTER V

PROCEDURES

This chapter describes the procedures followed to operationalize the research methodology. The chapter includes sections on the solicitation of subjects and reports on demographic data.

Subjects

To obtain subjects/participants the following procedures were followed. A convenience sample was drawn from CPA firms in the East Texas area. This geographical limitation included local, regional, national and Big Six accounting firms. Initially, a member of potentially participating accounting firms was contacted to ensure participation. A follow up letter defining the purpose of the study and constraints was forwarded to partners and/or managers responsible for scheduling. A date was set for the site visits.

The sample included auditors from three Big Six firms and one national firm representing the Houston area. Additionally, one regional, and three small firms representing the East Texas area were included. Two other firms agreed to participate, but because of scheduling problems, had to cancel.

A total of eight site visits were conducted during October, 1992. The conditions and environmental aspects of the visits were highly similar. Typically, the participants gathered in the board room where the Control instrument (Appendix B), the Schema Instrument (Appendix C) and the Taxonomic Instrument (Appendix D) were randomly distributed. Participants were welcomed with entrance comments (Appendix E) and given instructions (found on page two of each instrument). During the post experimental phase, exit comments were also given (Appendix E). The entrance and exit comments were read from a printed page by the experimenter, thus ensuring high similarity across site visits. The instruments were color coded and pre-sorted to allow for random distribution among the participants. Hence each participating firm provided at least one participant for each of the three experimental groups: taxonomic, control, schema. The maximum number of participants provided by one firm was 21, while the minimum was 6. The average was approximately 9.

Demographic Analysis of the Data

A total of 70 participants completed the study. Twenty-two of these received taxonomic treatment (GROUPT). Twenty-six of these received schematic treatment (GROUPS). The remaining twenty-two were members of the control group. A table of the mean values and standard deviations for all

questions contained on Document #3 and Document #4 are included in Appendix E.

A frequency analysis of the EXPNUM variable revealed that 24 participants (34%) reported zero accounts receivable auditing experience. Of these 24, fifteen reported zero auditing experience and zero public accounting experience. The remaining 9 possessed some form of either auditing experience or public accounting experience. A distribution of the EXPNUM variable is found below. This table also reveals that approximately 66% of the auditors participating in this study had actual accounts receivable auditing experience.

Table A.1 EXPNUM

EXPNUM	Frequency	Percent
0 a/r audits	24	34.3
5 a/r audits	14	20.0
10 a/r audits	7	10.0
20 a/r audits	10	14.3
21 a/r audits	15	21.4

Other data, collected on the participant questionnaire may help explain the EXPNUM variable. An analysis of this data revealed that the sample included 57% staff, 17% seniors, 7% supervisors, 4% managers, 14% partners, and 1% sole practitioners. For contacted firms, the minimum number of partners was three. This indicates that the 1% sole practitioner represented a mis-coding by the participant.

The percentage of participants that described their firm as local included 26%. Another 10% described their firm as regional, and 63% described their firm as national. Another 1% described their firm as international. This response was added by the participant and was not preprinted on the participant questionnaire. An actual count of the participants revealed the following distribution: National 64%, Regional 12%, and local 24%. These percentages are highly similar to those reported by the participants. This provides partial evidence that the candidates took the task seriously.

Additionally, most of the participants reported that their firm used standard workprograms and serviced a variety of clients. Given the number of participants from regional as well as national firms, this is not surprising.

Only 29% reported reading articles that described the benefits of using accounts receivable audit confirmations. Approximately 40% reported reading articles describing the problems associated with using accounts receivable audit confirmations. When these variables were used as co-variates, no significant explanatory power was added. Additionally, the mean EXPNUM value for each of the three groups and their standard deviations, and n's are reported below.

Table B.1 - Groups

	GROUPT	GROUPS	Control
EXPNUM Mean	10.4545	7.6153	10.3181
EXPNUM Std. Dev.	9.8209	7.8489	9.3726
n	22	26	22

In addition to the data reported above, answers to all of the questions on Document #4 (Participant Questionnaire) were used as additional dummy variables in regression equations. None of the covariates added significant descriptive capabilities (at the .0001 level) to the regression equation. However, two covariates tested significant at the .05 level. Herein, auditors who were actively involved in the assessment of audit risk seemed to have more confidence in accounts receivable confirmation judgments. Additionally, auditors who last performed part of an accounts receivable audit six months ago seemed to have more confidence in the accounts receivable confirmation judgments. Other interesting findings indicate that participants classified as staff or managers produced a negative EXPNUM parameter estimate as compared to seniors, supervisors, partners, and sole proprietors on overall confidence (C1). Other data is reported in Appendix E in both combined and group form.

CHAPTER VI

RESULTS

Specific Results of data analysis are discussed in this section. The discussion will begin with testing for H1 and continue through H5.

Hypothesis Testing - H1

H1 tests whether auditors representing the accounts receivable workprograms as schemas express a higher degree of confidence in their accounts receivable confirmation judgments than auditors representing the accounts receivable task by assertion (or taxonomic treatment). The basic regression equation used to test these variables is as follows.

$$Q4=\beta_0+\beta_1 EXPNUM+\beta_2 GROUPT+\beta_3 GROUPS+e$$

Following Cohen and Cohen [1983], a hierarchical analysis was utilized. To operationalize the hierarchical analysis, the independent variable EXPNUM was initially entered into the equation. A regression analysis was run to determine the initial R^2. The second variables entered into the equation were type of treatment signified by GROUPT and GROUPS.

Table C.1 reports an R^2 of .2038 (adjusted R^2 .1921) after the first variable (EXPNUM) is entered into the hierarchical analysis. As such, some 20% of the variance in confidence scores is accounted for by the number of times that the auditor has participated in an accounts receivable audit engagement.

Table C.1
Dependent Variable: Q4-Question 4
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	1	7622.54327	7622.54327	17.409	0.0001
Error	68	29773.52816	437.84600		
C Total	69	37396.07143			

Root MSE	20.92477	R-square	0.2038
Dep Mean	59.35714	Adj R-sq	0.1921
C.V.	35.25232		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > |T|
INTERCEP	1	48.377395	3.63038934	13.326	0.0001
EXPNUM	1	1.173408	0.28122884	4.172	0.0001

Table C.2 reports that after the second group of variables (GROUPT and GROUPS) was added, R^2 increased to .2046 (adj. R^2 decreased to .1685). This increase of the unadjusted R^2 is minimal at best and is probably attributed to the addition of extra parameters. As reported, the adjusted R^2 decreases. Cohen and Cohen [1983] suggest interpreting the minimal increase as the increment produced by treatment over experience ((.2038 - .2046) = .0008). As these authors imply, this causal priority indicates that the strong relationship between confidence and experience in actual accounts receivable auditing is due to the number of times that the auditor has had direct experience with audits of accounts receivable. The reported p value associated with EXPNUM is .0001, indicating this strong relationship. Additionally, there is no support for the hypothesis that taxonomic or schematic treatment influences confidence.

Table C.2 also reports the individual t tests for the parameter estimates. For the estimates of GROUPT (Taxonomic) and GROUPS (Schema), the printed test is related to differences between the taxonomic (GROUPT) and control and between schema (GROUPS) and control. Neither of ariables produced significant results. To test for differences between GROUPT and GROUPS, Cohen and Cohen [1983] construct an appropriate t test as follows:

$$t = \frac{\beta i - \beta j}{\sqrt{sd^2 \frac{1}{n_i} + \frac{1}{n_j}}}$$

with df=n-k-1. Where sd^2 is the mean square of the residuals from the regression. Cohen and Cohen [1983] imply that this test uses all of the information available in the sample about the Y variability within groups (including the control), not only that of the schema and taxonomic groups.

Table C.2
Dependent Variable: Q4 - Question 4
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	3	7651.53495	2550.51165	5.659	0.0016
Error	66	29744.53648	450.67480		
C Total	69	37396.07143			

Root MSE	21.22910	R-square	0.2046
Dep Mean	59.35714	Adj R-sq	0.1685
C.V.	35.76503		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > |T|
INTERCEP	1	47.950277	5.41789131	8.850	0.0001
EXPNUM	1	1.167815	0.28861421	4.046	0.0001
GROUPT	1	1.431662	6.40093625	0.224	0.8237
GROUPS	1	0.079443	6.19898108	0.013	0.9898

This equation, based upon the information contained in Table C.2, produces an insignificant t-statistic of .4554 with 66 df. Hence, it can be said that there is no difference in confidence between the taxonomic and schema groups. This also indicates that confidence was not influenced by schematic or taxonomic treatment. Additionally, the means of Q4 by group are reported as follows; Control Group 60.00, Schema Group 56.923, and Taxonomic Group 61.590.

In summary, Hypothesis Testing of H1 did not reveal a significant difference in confidence between the groups, controlling for experience effects. Hypothesis testing of H1 revealed that schematic groups did not produce significantly higher confidence scores relating to accounts receivable confirmations than taxonomic groups or control groups. However, the testing procedures revealed that as accounts receivable auditing experience increased, confidence in judgments made regarding accounts receivable confirmations significantly increased as well. This implies that confidence is positively related to experience but not to schematic or taxonomic treatment.

Hypothesis Testing - H2

H2 tests whether auditors representing the accounts receivable task by assertion (taxonomic) will express a higher degree of confidence in judgments made using confirmations for satisfaction of the existence assertion

(Q5) than judgments made using confirmations for satisfaction of the valuation assertion (Q7), and rights and obligation assertion (Q9). As outlined in the research methodology chapter, testing of this hypothesis will utilize a partialing technique, given the co-dependent variables Q5 and Q7. Univariate data for the taxonomic group is presented below in Table D.1

Table D.1
Taxonomic Group - Univariate Data

Variable	N	Mean	Std. Dev.
Q5	22	73.1818182	17.4264068
Q7	22	62.9545455	22.3957421
Q9	22	44.5909091	33.0564583

Similar data for the Control and Schematic Group is presented in Table D.2.

Table D.2
Schema and Control Group - Univariate Data

Variable	N	Mean	Std. Dev.
		Schema Group	
Q5	26	65.1538462	27.0224977
Q7	26	55.9615385	26.1541290
Q9	26	48.6538462	31.7665765
		Control Group	
Q5	22	70.5909091	25.8211045
Q7	22	44.3181818	24.5092526
Q9	22	70.5454545	25.5356469

An additional analysis of the hypothesis was also conducted. Using the SETCOR procedure described earlier,

two dependent variables (Q5 and Q7) were regressed against the mode of organization [GROUPT (taxonomic) or GROUPS (schematic)] and experience (EXPNUM). This resulted in the whole set association reported in Table D.3 An R^2 of .190 was reported as being significant at the .03 level.

Table D.3
Whole Set Correlation Analysis (Y = Q5, Q7)
(X = GROUPT, GROUPS, EXPNUM)
(N = 70)

Rao F = 2.404, Df = 6, 130 Prob = 0.031
R-Square = 0.190 Adj. R-Square = 0.113

Significance Tests For Prediction of Each Basic Y Variable

Variable	F-Statistic	Probability
Q5	1.130	0.343
Q7	2.322	0.083

Betas Predicting Basic Y (COL) From Basic X (ROW) Variable

	Beta Q5	Beta Q7
GROUPT	0.049	0.345*
Std Er	0.141	0.137*
T stat	0.352	2.517*
p val	0.726	0.014*
GROUPS	-0.086	0.212
Std Er	0.142	0.138
T stat	-0.605	1.531
p val	0.547	0.131
EXPNUM	0.170	-0.084
Std Er	0.121	0.118
T stat	1.399	-0.713
p val	0.166	0.478

*significant at .01 level

To analyze the effects of confidence for the taxonomic groups only, Cohen [1989] suggests analyzing the betas of the independent variables (GROUPT, taxonomic; and GROUPS schematic). Referring to table D.3, the betas for the taxonomic group illustrate that the Q7 coefficient (.345) yields statistically significant explanatory power (at the .01 level) to the model. Additionally, between GroupT and GroupS, the coefficients are smaller for GroupS than GroupT. This is consistent with the discussion that taxonomic treatment should result in stronger confidence in accounts receivable confirmation procedures as compared to schematic treatment. According to Cohen and Cohen [1983], the next step is to proceed to the partialing stage.

When Q5 (confidence relating to the existence assertion) is partialed from the Q5, Q7 set (see Table D.4), R^2 drops to .147, but is still significant at the .01 level. Additionally, the GROUPS and GROUPT coefficients test significant at the .05 level. Additionally, the negative sign of the EXPNUM variable indicates that as experience increases, the confidence assigned to the accounts receivable confirmation procedure for satisfaction of the valuation assertion decreases. This result is in the predicted direction, however it is statistically insignificant.

Table D.5 reveals that the partialing of Q7 from the set Q5 and Q7, produces a significant EXPNUM coefficient at

the .05 level. When Q7 (confidence for the valuation assertion) is partialed, R^2 drops to .100. Additionally, the sign of the EXPNUM coefficient is positive indicating that as experience increases, the confidence assigned to the accounts receivable confirmation procedure for satisfaction of the existence assertion increases as well.

Table D.4
Dependent Set Q5, Q7, Partialed by Q5.

Rao F = 3.768 Df = 3, 65 Prob = 0.015, R-Square = 0.147
Adj. R-Square = 0.107
Betas Predicting Basic Y (C2) From Basic X (GROUPT, GROUPS EXPNUM) Variables.

Standard Errors, T statistics, and Probabilities for Betas

	Betas Q7	Std. Err. Q7	T-Stat. Q7	Prob. Q7
GROUPT	0.366	0.133	2.739	0.008*
GROUPS	0.287	0.135	2.133	0.037**
EXPNUM	-0.188	0.115	-1.630	0.108

* significant at the .01 level
** significant at the .05 level

Table D.5
Dependent Set Q5, Q7 Partialed by Q7.

Rao F = 2.521 Df = 3, 65, Prob = .066, R-Square = .100
Adj. R-Square = .059
Betas Predicting Basic Y (C3) From Basic X (GROUPT, GROUPS EXPNUM) Variables.

	Beta Q5	Std. Err. Q5	T-Stat. Q5	Prob. Q5
GROUPT	-0.130	0.135	-0.967	0.337
GROUPS	-0.212	0.136	-1.559	0.124
EXPNUM	0.239	0.116	2.051	0.044*

* significant at the .05 level

In summary, Hypothesis testing of H2 reveals that auditors representing the accounts receivable task by assertion (taxonomic) express a higher degree of confidence in judgments made using confirmations for satisfaction of the existence assertion (Q5) than for judgments made using confirmations for satisfaction of the valuation assertion (Q7). These results are positively associated with increases in experience.

Hypothesis Testing - H3

H3 tests for differences in reliability and confidence judgments among experienced versus inexperienced auditors. Experienced auditors are expected to produce lower (higher) reliability (confidence) judgments than inexperienced auditors.

The hypothesis implies two dependent variables; Overall Confidence (C1) and Reliability (REL). As outlined in the research methodology section, testing of this hypothesis will utilize a partialing technique, given the co-dependent variables C1 and REL.

To begin analysis of this hypothesis, these two dependent variables were regressed against the independent variable EXPNUM. This analysis produced a highly significant (.0001) R^2 of .354 (Reported in Table D.6). The reported betas reveal a greater inclination (significant at the .0001 level) for experienced participants to respond with higher confidence levels.

Table D.6
Whole Set Correlation Analysis (Y = C1, REL)
(X = EXPNUM)
(N=70)

Rao F = 18.368, DF = 2.0, 67.0 PROB = 0.0001
R-square = 0.354 Adj. R-Square = 0.335

Betas Predicting Basic Y (COL) From Basic X (ROW) Variables

	C1	REL
Beta (EXPNUM)	0.578*	0.017
Std. Error	0.099*	0.121
T- Statistics	5.846*	0.144
Probabilities	0.000*	0.886

When the variable REL is partialed form the whole set, R^2 remains at .354 (See Table D.7). This indicates that most of predictive capability of the experience variable (EXPNUM) is related to the variable C1. The test also implies that REL does not significantly relate to the experience level of the auditor. Furthermore, additional analyses revealed that C1 and REL produce a correlation coefficient of only .2647. Hence, this indicates that C1 and REL are not significantly correlated, and that experience helps explain confidence associated with accounts receivable confirmation judgments but not the expected reliability of the confirmation returns.

Table D.7
Dependent Set C1, REL, Partialed by REL

Rao F = 36.705 Df = 1, 67, Prob = .0001
R-Square = .354 Adj. R-Square = .344

Betas Predicting Basic Y (C1) From Basic X (Expnum) Variables.

	C1
EXPNUM Beta	0.595 *
Std Err.	0.098 *
T-Stat.	6.058 *
Prob.	0.0001*

Additionally, a partialing of C1 from REL yields an R^2 of only .02. Hence, the model no longer tests significant.

In summary, Hypothesis testing of H3 provided evidence that experienced auditors produced significantly higher confidence scores than inexperienced auditors. Alternatively, H3 testing provided evidence that experienced auditors did not produce significantly lower reliability estimates associated with the accounts receivable confirmation.

Hypothesis Testing - H4

H4 is testing whether experienced auditors will be able to recall more accounts receivable substantive tests from both taxonomic and schematic organizations than inexperienced auditors. The variables necessary to conduct this test include the number of items recalled (RECALL) and

the number of times an auditor has participated in an accounts receivable audit (the EXPNUM variable).

To operationalize statistical testing, the EXPNUM variable was entered into the regression equation as the independent variable. RECALL was entered into the regression equation as the dependent variable. This provided the analysis reported in Table E.1.

Table E.1
Dependent = RECALL, Independent = EXPNUM

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	1	310.05277	310.05277	32.829	0.0001
Error	68	642.23294	9.44460		
Total	69	952.28571			

Root MSE	3.07321	R-square	0.3256
Dep Mean	7.71429	Adj R-sq	0.3157
C.V.	39.83787		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > |T|
INTERCEP	1	5.499865	0.53319288	10.315	0.0001
EXPNUM	1	0.236656	0.04130389	5.730	0.0001

Table E.1 reports that the model tests significant at the .0001 level. Additionally, the Coefficient of EXPNUM is positive and tests significant at the .0001 level. This suggests that as experience increases, recall increases as well.

Hypothesis Testing - H5

H5 posits that experienced auditors use taxonomic and schematic storage, while inexperienced auditors will more likely use only schematic storage. The data necessary to conduct this test includes the items recalled by the participant. The control group provided a non-manipulated free recall which can be used to test the participants' natural organization preferences.

Two non-parametric tests outlined in the research methodology section were used to conduct this test. These included an Adjusted Ratio of Clustering used by Weber [1980] and an Runs up and down test suggested by Gibbons [1985].

To operationalize the Adjusted Ratio of Clustering (ARC) test, the recall string was recoded according to whether the procedure recalled matched a particular assertion. Each procedure listed (recalled) by the participant was coded by the following scale: E - the step relates to the Existence Assertion, V - the step relates to the Valuation Assertion, R - the step relates to the Rights and Obligation Assertion, P - the step relates to the financial statement Presentation assertion, and C - the step relates to the Completeness assertion. For each participant completed instrument, the recoding resulted in a alpha data string similar to the one produced by participant #63.

E C V V E C R

To statistically test the presence of clustering (or evidence of taxonomic organization), the ARC score suggested by Weber [1980] was used. For interpretation, Roenker, Thompson, and Brown [1971] imply that an ARC score reflecting clustering produces an ARC score between +.50 to 1 or -.50 to -1.

Table F.1 reports the ARC score and the underlying experience level for the Control group. As a reminder, results from this group are untreated and free from manipulation. Participants were not influenced by the experimenter as to taxonomic or schematic treatment. As such, their recall, is untainted by experimenter suggestions and provides the best data for determining which type of storage experienced versus inexperienced auditors use.

Table F.1 ARC - Control Group

ID#[10]	R	N	OBS#	M(R)	SUM N	E(R)	ARC		Expnum
C28	5	9	3	6	33	2.6667	0.7000	*	21
C26	4	8	2	6	32	3.0000	0.3333		21
C46	1	9	3	6	29	2.2222	-0.3235		21
C37	3	10	3	7	52	4.2000	-0.4286		21
C64	3	7	2	5	32	3.5714	-0.4000		21
C20	7	13	3	10	91	6.0000	0.2500		21
C11	5	14	5	9	75	4.3571	0.1385		20
C5	3	9	3	6	28	2.1111	0.2286		20
C44	3	4	1	3	16	3.0000	0.0000		10
C22	2	5	2	3	17	2.4000	-0.6667	*	10
C32	2	4	2	2	10	1.5000	1.0000	*	10
C47	5	7	2	5	29	3.1429	1.0000	*	5
C33	0	5	3	2	11	2.0000	ERR[11]		
C4	1	3	2	1	5	0.6667	1.0000	*	5
C42	1	5	3	2	9	0.8000	0.1667		5
C55	0	4	3	1	6	0.5000	-1.0000	*	0
C40	0	4	3	1	6	0.5000	-1.0000	*	0
C61	0	0	0	0	0	ERR	0.0000		0
C59	7	10	3	7	54	4.4000	1.0000	*	0
C6	4	7	3	4	17	1.4286	1.0000	*	0
C17	1	3	2	1	5	0.6667	1.0000	*	0
C38	1	2	1	1	4	1.0000	0.0000		0

The control group participants achieving a significant ARC score [i.e. above + or - .5] are noted with an asterisk in Table F.1. An analysis of the table indicates that clustering becomes more prominent as experience decreases. Given that the presence of clustering is used to indicate taxonomic organization, it appears that inexperienced participants are prone to use a taxonomic organization for

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[10] ID # equals the identification number of the participant. The number consists of a letter (C,S,T) corresponding to group treatment (Control, Schema, Taxonomic) followed by a number.

[11] ERR notes when the numerator or denominator equal zero.

the audit of accounts receivable. Additionally, this indicates that inexperienced auditors more often understand the accounts receivable auditing task in terms of client assertions.

Tables reflecting the ARC scores for the Schema and Taxonomic Treatment groups are presented in Table F.2 and F.3. Results reported in these two tables serve as manipulation checks as to the effectiveness of treatment.

Table F.2 ARC - Taxonomic

ID #	R	N	OBS#	M(R)	SUM N	E(R)	ARC		Expnum
T35	4	12	4	8	39	2.2500	0.3043		21
T21	6	10	3	7	46	3.6000	0.7059	*	21
T18	6	10	3	7	46	3.6000	0.7059	*	21
T15	3	4	1	3	16	3.0000	ERR		21
T25	1	5	2	3	13	1.6000	-0.4286		21
T8	3	8	4	4	18	1.2500	0.6364	*	20
T10	4	9	4	5	25	1.7778	0.6897	*	20
T13	4	13	4	9	60	3.6154	0.0714		20
T48	3	9	4	5	21	1.3333	0.4545		20
T67	5	12	3	9	50	3.1667	0.3143		20
T24	7	13	2	11	85	5.5385	0.2676		12
T36	9	13	3	10	74	4.6923	0.8116	*	10
T66	2	8	4	4	27	2.3750	-0.2308		5
T27	1	2	1	1	4	1.0000	ERR		0
T52	1	2	1	1	4	1.0000	ERR		0
T60	1	2	1	1	4	1.0000	0.0000		0
T50	1	2	1	1	4	1.0000	ERR		0
T7	1	4	3	1	6	0.5000	1.0000	*	0
T2	3	9	3	6	29	2.2222	0.2059		0
T39	1	4	3	1	6	0.5000	1.0000	*	0
T56	4	11	3	8	49	3.4545	0.1200		0
T51	1	2	1	1	4	1.0000	0.0000		0

The taxonomic group participants achieving a significant ARC score [i.e. above + or - .5] are noted with an asterisk in Table F.2. If experience is defined as cases

when the auditor has participated in at least five accounts receivable audits, an analysis of Table F.2 indicates that treatment was slightly more effective for experienced participants versus inexperienced participants. A comparison of these results to the control group indicates that treatment was at least partially effective.

Further analysis involves the idea that taxonomic treatment encourages clustering, and that ARC scores test for the presence of clustering. To determine if taxonomic treatment influenced recall order, the ARC scores of the taxonomic group should be compared with the ARC scores from the schematic group (Table F.3). The number of significant ARC scores should be higher for the taxonomic groups versus the schematic group. If this result is found then it can be said that taxonomic treatment influenced recall order.

Table F.3 ARC - Schema

ID #	R	N	OBS#	M(R)	SUM N	E(R)	ARC		Expnum
S23	3	11	3	8	38	2.4545	0.0984		21
S16	4	11	3	8	51	3.6364	0.0833		21
S31	6	12	3	9	75	5.2500	0.2000		21
S9	6	13	4	9	67	4.1538	0.3810		20
S14	3	12	4	8	39	2.2500	0.1304		20
S19	2	7	4	3	15	1.1429	0.4615		20
S45	1	8	3	5	24	2.0000	-0.3333		10
S30	5	12	4	8	46	2.8333	0.4194		10
S3	2	8	4	4	18	1.2500	0.2727		10
S69	4	9	3	6	29	2.2222	0.4706		5
S65	3	9	4	5	27	2.0000	0.3333		5
S29	0	4	3	1	6	0.5000	-1.0000	*	5
S43	2	9	4	5	27	2.0000	0.0000		5
S1	3	9	3	6	29	2.2222	0.2059		5
S43	5	11	4	7	39	2.5455	0.5510	*	5
S12	4	11	3	8	61	4.5455	-0.1579		5
S68	1	5	3	2	11	1.2000	-0.2500		5
S41	3	9	4	5	23	1.5556	0.4194		0
S53	3	8	3	5	26	2.2500	0.2727		0
S49	1	6	3	3	14	1.3333	-0.2000		0
S54	1	5	3	2	9	0.8000	0.1667		0
S58	1	3	2	1	5	0.6667	1.0000	*	0
S62	4	8	2	6	34	3.2500	0.2727		0
S57	3	9	3	6	29	2.2222	0.2059		0
S63	1	7	4	3	13	0.8571	0.0667		0

Schematic group participants achieving a significant ARC score [i.e. above + or - .5] are noted with an asterisk in Table F.3. Based upon results reported in Table F.3, as experience decreased, a token few participants produced a significant clustering score. The lack of significant scores in this group, produces interesting results. The ARC score is designed to measure clustering (or evidence of taxonomic organization) and alternatively, schematic treatment is designed to stimulate a temporal organization. The lack of clustering provided by the schematic treatment

group is a weak indicator that taxonomic treatment was at least partially effective.

To test whether participants organize their recall in terms of a schema, the Runs Up and Down test [Gibbons, 1985] described in the research methodology section was used. To operationalize this test, the recall string was recoded in terms of a sequence of temporal steps. Each recalled item was reassigned the temporal number of the workprogram step listed on the schematically organized workprogram. As such, each procedure listed (recalled) by the participant was coded with a numerical order. For each completed instrument, the recoding resulted in a numeric data string similar to the one produced by participant #63.

4 2 3 15 4 1 11

The null hypothesis is randomness (i.e. no pattern of sequence). The alternative hypothesis, is that a sequence exists (i.e. there is evidence of schematic organization).

Table G.1 reports Runs Up and Down scores and the underlying experience level for members of the Control group. These results are interpreted as p-values and are organized by experience. As such, a low value approaching .01 indicates the presence of a temporal (schematic) trend. As stated earlier, results from this group are untreated and free from manipulation. As such, participants were not influenced by the experimenter as to taxonomic or schematic treatment and their recall should be untainted by

experimenter suggestions. Thus, the control group provides the best data for determining which type of storage experienced versus inexperienced auditors use if they are allowed to access information in an untreated form.

Table G.1
Runs Up and Down Test - Control Group

RECALL	ID #	V	N	Table Value[12]	EXP
+-0++-+-	C46	6	9	0.5653	21
00--+0	C64	2	7	0.0250 *	21
0--+0-+--	C37	5	10	0.2427	21
+--++0-	C26	4	8	0.3124	21
+-0++--+-	C28	6	9	0.5653	21
+-+-0+-+0-+0	C20	9	13	0.4587	21
-+++-0+-+00-+0	C11	8	14	0.3633	20
+0+-0+-+-	C5	6	10	0.7573	20
0++	C32	1	4	0.0833 **	10
0+0	C44	1	4	0.0833 **	10
++0+	C22	1	5	0.0167 *	10
0-0+	C42	2	5	0.2500	5
+-	C4	2	3	0.6667	5
+-+-	C33	4	5	0.2667	5
+--0-0	C47	2	7	0.0250 *	5
0	C61	0	0	ERR[13]	0
+0+	C40	1	4	0.0833 **	0
-+++-+0	C6	4	7	0.8091	0
+-	C17	2	3	0.6667	0
+++	C55	1	4	None	0
-	C38	1	2	None[14]	
0+--0+-0-	C59	4	10	0.0633 **	0

[12] According to Gibbons [1985], the V and N scores are used to consult a "Number of Runs Up and Down Distribution Table" that reports p values. As such a low table value approaching .0001 is considered significant.

[13] ERR in the Runs Up and Down distribution indicates that the participant reported zero recall. ERR is used instead of Zero because of the nature of the P-values reported. As such, recalling zero is not considered significant.

[14] None indicates that the consulted table reported no value for this situation.

Gibbons [1985] suggests reporting significant results at the .05 and .10 level. An analysis of the reported results in Table G.1 indicates that three participants tested significant (for schematic organization) at the .05 level and four participants tested significant (for schematic organization) at the .10 level. Additionally, these seven participants had varying levels of experience. This implies that some members of the control group organized in a schematic fashion.

As outlined in the Methodology Chapter the Runs Up and Down test was chosen as the preferred test for the presence of schematic storage. It was argued that the ARC procedure more effectively tests for categorical storage. However, a comparison of G.1 and F.1 reveals that some of the participants tested significant for both types of storage. This implies that the Runs Up and Down Test is not as effective as hoped in discriminating between types of storage. As such, since it is unclear which test is correct, we have to be careful about drawing conclusions about the effect of manipulation or alternatively, that the participants use an unidentifiable type of storage that cannot be statistically modeled.

A separate schema (Runs Up and Down) analysis was performed to test members of the taxonomic group for evidence of schematic storage. Members of this group were given a taxonomic instrument. If treatment is effective,

there should be only random cases of a significant Runs Up and Down score. Results of this analysis are reported in Table G.2.

Table G.2

Runs Up and Down Test - Taxonomic Group

RECALL	ID #	V	N	Table Value	EXP
0+--0+-+	T18	5	10	0.2427	21
++0++0-+-+-	T35	6	12	0.1918	21
+-0	T15	2	4	0.9167	21
--+-	T25	3	5	0.7500	21
+--+0--+	T21	5	10	0.2427	21
0+0-+-+	T8	5	8	0.6876	20
+++-+0-	T10	4	9	0.1500	20
-+00---+--+	T67	6	12	0.1918	20
+--+0-+-	T48	6	9	0.5653	20
-++0-+-++0--	T13	7	13	0.2749	20
0++0+-+-+-00	T24	6	13	0.0964	12
+-00+--00--+	T36	5	13	0.0213 *	10
-+++00-	T66	3	8	0.0749 **	5
+0+	T39	1	4	0.0833 **	0
0	T60	0	2	none	0
0	T50	0	2	none	0
+	T51	1	2	none	0
-+-	T52	3	4	0.4167	0
0	T27	0	2	none	0
++-+	T2	3	5	0.7500	0
+-+	T7	3	4	0.4167	0
-00+--+-+0	T56	6	11	0.3438	0

* Significant at the .05 level.
** Significant at the .10 level.

The results reported in Table G.2 reveal the application of a Runs Up and Down Test (a schematic organization test) to a treated (taxonomic) group. This analysis serves as a manipulation check as to the effectiveness of the schematic/taxonomic treatment. As

indicated in Table G.2, very few participants (only one at the .05 level) in this group produced a significant Runs Up and Down Score.

A separate schema (Runs Up and Down) analysis was performed to test members of the schematic group for evidence of schematic storage. Members of this group were given a schematic instrument implying schematic treatment. If schematic treatment is effective, there should be many cases of a significant Runs Up and Down score in this group. Results of this analysis are reported in Table G.3. This analysis is used primarily as a manipulation check, but also provides information on the receptiveness of different experience levels to treatment.

Table G.3

Runs Up and Down Test - Schematic Group

RECALL	ID #	V	N	Table Value		EXP
+++0-+-+--0	S31	5	12	0.0529	**	21
++-+-+-+-+	S23	9	11	0.1177		21
++0-+-+--	S16	6	11	0.3438		21
+-0++0+0000	S9	3	13	0.0001	*	20
+0+-+-+000	S14	5	12	0.0529	**	20
+--+-0	S19	4	7	0.8091		20
0++++0-0-0+	S30	3	12	0.0005	*	10
+-+-+0	S3	5	7	0.4417		10
-+00--	S45	3	8	0.0749	**	10
0+-+0000	S43	3	9	0.0257	*	5
-+00--+00	S69	4	9	0.1500		5
+00+00-00	S43	2	11	0.0001	*	5
+++0-00-	S65	2	9	0.0014	*	5
-++	S29	2	4	0.9167		5
++0--+0-++	S12	5	11	0.1196		5
+0++++0	S1	1	8	0.0000	*	5
-+++	S68	2	5	0.2500		5
-++--+	S63	4	7	0.8091		0
0+-++-+	S62	5	8	0.6876		0
0+-++0-+	S57	5	9	0.4347		0
-+0-+00-	S41	5	9	0.4347		0
---+	S54	2	5	0.2500		0
++++00-	S53	2	8	0.0063	*	0
+-	S58	2	3	0.6667		0
-+0+-	S49	3	6	0.4139		0

* Significant at the .05 level.
** Significant at the .10 level.

As noted by the number of asterisks indicating significance in Table G.3, the schema treatment seemed to be effective. These results imply that very often, the schema treated participant produced a significant Runs Up and Down Score even though this was not the case for the ARC test. When experience is defined as cases when the auditor has participated in at least five accounts receivable audits,

the likelihood of effective schematic manipulation is greater than for inexperienced participants.

H5 states that experienced auditors use taxonomic and schematic storage, whereas inexperienced auditors more likely use schematic storage. In order to test H5, Table F.1 (ARC scores for the control group) and G.1 (Runs Up and Down scores for the control group) were used. These Tables are consulted since they report results free from manipulation. Table F.1 indicates that inexperienced participants are more prone to organize in a taxonomic fashion than experienced participants. Table G.1 reports mixed results. When the results are combined, some 75% of the experienced control group (where experience equals 20 or more accounts receivable engagements) do not test significant for either type of storage or use some unspecified strategy to organize their recall.

Alternatively, some 75% of both the mid-experience range (5-10) and low experience range (0) participants used either the taxonomic or schematic form of organization. At first glance, these results imply that inexperienced participants (rather than the hypothesized experienced participants) utilize taxonomic and schematic storage, while experienced auditors use no identifiable form.

A logical interpretation of these findings may be based upon recency. The accounts receivable task is most often assigned to inexperienced personnel. As such, the

participant with the most knowledge, and the better recall ability of accounts receivable audit workprogram steps may be relatively inexperienced otherwise. Conversely, as a participant gains experience, s/he moves on to more complicated tasks, loses the benefits of recency and approaches a more random memory organization of accounts receivable audit workprograms.

An additional analysis of the effectiveness of schematic and taxonomic treatment indicates that treatment seems to be more effective for the experienced participants versus inexperienced participants. Referring to Table F.2 (ARC scores for Taxonomically treated participants) and Table G.3 (Runs Up and Down Scores for Schematically treated participants) some 38% (from F.2) and 52% (from G.3) of the experienced participants responded to treatment. Alternatively, only 22% of the inexperienced taxonomically treated auditors responded to taxonomic treatment, and only 13% of the inexperienced schematically treated auditors responded to schematic treatment. These results imply that experienced auditors may be more capable of being influenced and responding to type of storage treatment. This implies that they are capable of using either type of storage.

A comparison between Table F.3 (ARC scores for Schematically treated participants) and Table G.2 (Runs Up and Down Scores for Taxonomically treated participants) seems to reveal that treatment was relatively effective.

Results reported in Table F.3 indicate that schematically treated participants did not organize taxonomically. Results reported in Table G.2 indicate that taxonomically treated participants did not organize schematically.

This discussion presents some interesting findings regarding possible expertise or experience. Possibly some of the confounding results in experience/expertise studies, have been the product of ill-defined attributes surrounding experience or expertise. Possibly, the recency effect is the most significant driver of methods of organization and strong enough to override and make up for lack of experience. Possibly, memory structures cannot be successfully modeled statistically.

Order of Importance Testing

Additionally testing of the recall string was utilized to test the order of importance theory (and Fuzzy Trace Theory) reported by Brainerd and Reyna [1990]. To operationalize this test, the importance coding provided by the participant, and described in the research methodology section was used. If the fuzzy trace theory is correct, a visual inspection of these participant coded recall strings, should match results from the calculated ARC and Runs up and down test presented in tables F.1, F.2, F.3 and G.1, G.2, and G.3.

With N=70 participants reporting, some 11% coded their recall string to match a w-s-w (theorized to indicate

schematic) order of importance. Approximately, 85% used a s-w (theorized to indicate taxonomic) recall string, and the other 4% used some type of random coding unidentifiable to the experimenter. When these two types of recall codings were compared with receiving taxonomic treatment versus schematic treatment, or the experience variable, no trend was detected. Alternatively, these 11% of participants did produce high confidence scores. This indicates that regardless of organization method, most participants recall in a S-w form.

An explanation of these findings centers around the way in which Brainerd and Reyna [1990] tested their hypotheses versus the way the hypotheses are tested in this research. Brainerd and Reyna [1990] tested their theory using experimenter estimated orders of importance. As such, they assumed that members with different types of experience (i.e. experienced and inexperienced) would have identical strengths of memory traces. In other words, the authors assumed that what was important to an experienced participant was equally as important to an inexperienced participant.

Alternatively, this study allowed the participant to assign his/her own importance order to elements in the recall string. This assignment revealed that participants recall the strongest or most important substantive tests in

the primacy position. This finding is converse to Brainerd and Reyna's posited recall strings.

Additionally, a frequency analysis of the recall strings revealed that 95% of the participants recalled the accounts receivable confirmation procedure. Generally, this was recalled in the primacy positions (in 81% of the cases). This may be evidence that the participants find the procedure to be important or alternatively, that the distractor task was not strong enough to clear their short term memory.

Furthermore, some substantive tests (including the accounts receivable confirmation procedure) received different estimates of importance across auditors. Some auditors (83%) found the accounts receivable confirmation process to a most important procedure. An additional 10% ranked the procedure as being somewhat important, while only 7% ranked the procedure to be unimportant. A limited number of participants (45%) recalled a subsequent procedure (validating collection of the accounts receivable) that would strengthen the existence assertion. The remaining 55% ignored subsequent or alternative procedures that would strengthen satisfaction of the existence assertion. The results of the frequency analysis indicate that auditors in this experiment frequently recalled the accounts receivable confirmation procedure, but did not frequently recall alternate procedures.

CHAPTER VII

SUMMARY AND CONCLUSIONS

This research reports that experienced auditors (as compared with inexperienced auditors) have more confidence in their judgments concerning accounts receivable confirmations. Additionally, this confidence is uninfluenced by manipulation.

As reported in the background section of this paper Einhorn [1978] implies that high confidence is dangerous when it is associated with fallible judgments. Other authors [Davis et. al 1967; Sauls 1972; Warren 1975; Hubbard, 1972; and Caster 1990] imply that the confirmation procedure produces somewhat unreliable results. Caster reported that confirmations were associated with a detection rate of only 47% of accounts receivable seeded errors. This indicates that less than one half of the seeded errors placed in accounts receivable confirmations were noticed by the parties completing the confirmation. Caster concluded that confirmations are unreliable and provide inadequate evidence to support the existence assertion.

The unreliability of the confirmation procedure can be associated with several problems. One of these is the waste

of economic resources associated with sending and documenting an unreliable procedure in the audit setting. The other, is possible audit failure. As long as the auditor reports low confidence in these supposedly unreliable accounts receivable confirmations, no problems except waste of economic resources exist. However, if the unreliable confirmations are associated with high auditor confidence, fallible judgment (suggested by Einhorn [1978]) is inevitable.

Auditors in this study estimated that 82% of the confirmations received would be reliable. If this is contrasted with the 47% detection rate reported by Caster [1990], it appears that auditors in this study over-estimated the reliability of the results of the confirmation procedure.

These findings also support Pincus [1991]. She suggested that confidence can be viewed as a process variable. Under her process variable theory, there is no relationship between confidence and accuracy for judgment tasks. As such, there is no expected difference in confidence between correct and incorrect decisions. The dangers associated with this theory are that auditors will use a priori stopping rules. Here, the auditor would be likely to not only rely too heavily on the confirmation procedure, but ignore optional auditing procedures and prematurely abort searches for additional evidence as well.

Auditors in this study rarely mentioned (in only one case) alternatives to confirmation procedures. An additional 45% mentioned alternate steps, but only as follow ups of the confirmation procedure.

Other important findings indicated that increases in experience were associated with increases in recall. This implies that experienced auditors were able to recall significantly more substantive steps than inexperienced auditors.

Other interesting conclusions surround the analysis of the type of storage preferred by auditors and whether or not a participant can be manipulated. Given that statistical tests indicate a somewhat reliable and valid instrument, the ARC and Runs Up and Down tests provide partial evidence that experienced participants in an uncontrolled environment have an undetectable type of storage, whereas inexperienced participants prefer a categorical or taxonomic type storage. An analysis of control group recall strings indicate that as experience decreases the tendency to organize by assertion or category increases. This implies that most inexperienced participants think about the accounts receivable audit task by assertion. Additionally, experienced participants may randomly organize their thoughts in a variety of formats.

Although experienced auditors did not organize their thoughts categorically or schematically, the comparison of the recall from the taxonomic and schematic groups revealed

that they were more likely to respond to treatment, be it taxonomic or schematic. This lends support to the hypothesis that experienced participants are capable of using either taxonomic or schematic organization in their recall. Additionally, the tests imply that inexperienced participants are less likely to be effectively manipulated. If left untreated, they seem to organize in a categorical or taxonomic fashion.

The fact that experienced auditors were more likely than inexperienced auditors to respond to treatment implies that they may be using a more dynamic type expert system that is designed as a network rather than a hierarchical style. Here random access would be most efficient and is capable of producing a variety of recalls. Caution should be added however. Although the Runs Up and Down Test and the ARC test were interesting, the results were not definitive.

In terms of order of importance, 84% of the participants organized their thoughts by placing the most important procedures first. In most of the cases, the accounts receivable confirmation was listed first, and was rated as being a most important procedure. Additionally, the accounts receivable confirmation procedure was the most frequently recalled. Aside from confirmations, procedures classified as being most important varied widely among participants.

In summary, experienced auditors were able to recall more steps, were more responsive to treatment, and had more confidence in their judgments relating to accounts receivable confirmations. Alternatively, they did not report lower estimates relating to expected reliability of received confirmations. Only four participants (out of seventy) reported reliability levels lower than 51%. One of these had zero experience, two had participated in 5 audits, and another had participated in 21 audits of accounts receivable. This finding indicates that auditors still assess accounts receivable confirmations as being highly reliable and important. As stated earlier, most listed the accounts receivable confirmation procedure as a most important step.

Additionally, gains in experience did not seem to add to their audit skepticism, but rather only increased confidence in audit decisions. This presumably undaunted confidence in their judgment supports the worry that auditors may be auditing mechanically.

A statistical difference was also found between confidence associated with the existence assertion as compared to confidence associated with the valuation assertion for the taxonomic group. Confidence for the existence assertion was statistically higher than for the other assertions. There was no statistical difference

between reliability scores for experienced versus inexperienced participants.

Other Findings

No statistical support was found for H1 (Hypothesis 1). A difference was not detected between confidence levels reported by the schematic group as compared to the taxonomic group. Neither was a difference indicated between confidence levels reported by the control group as compared to the taxonomic and schematic groups.

Limitations of the Study

During the manipulation check phase, a graduate student was used to recoded the recall string to detect a taxonomic or schematic order. A coding sheet was used to guide coding of both schematic and taxonomic recall, however, only a limited number of coding combinations were feasible. Hence, some recall strings may have tested significant if several recall codes were rearranged.

As reported earlier, some overlap was present between results from the ARC and Runs Up and Down Tests. It was hoped that these tests would be rigorous enough to discriminate between taxonomic and schematic treatment results. However, this was not the case.

The study was also limited by the number of participants. Output interference theory would indicate that the position of the recall of the accounts receivable confirmation procedure might influence confidence levels.

Procedurally, testing this theory would have involved a much larger sample. Even then, it would be difficult to predict the number that might recall the procedure in the primacy position.

The study may have been influenced by individual accounting firm policy. During a post-experimental conversation with participants from one of the big six firms, it was revealed that their firm seldom used the accounts receivable confirmation. Instead, other procedures, such as tracing subsequent collections were considered more important. Additionally, a participant from one of local firms indicated that their clients had small accounts receivable balances. Hence, alternate procedures were better justified. These reports however, were inconsistent with reported results. Most participants included the accounts receivable confirmation step in their recall and indicated that they considered the procedure to be a most important step.

Another limitation involves the potential manipulation of a schematic or taxonomic organization. Each participant used in the study worked for a firm with an active quality control document. They also indicated that standard workprograms were used (question #14 on Document #4). It is unlikely that the experimenter generated workprogram matched each standard workprogram. This was partially controlled for by developing the instrument from the AICPA audit

manual. Conversations with several auditors previous to and during the pilot study, revealed that often the AICPA audit manual is used as a guide in developing standard workprograms. Additionally, manipulation checks, in the form of the ARC and Runs Up and Down test, indicated that the treatments were at least partially effective.

Since the experiment involved a routine audit task, it is doubtful if results would apply to complex tasks as well. It is also possible that years of experience may confound the results. Many participants may have gained their experience in the early 1980's during times when peer review and quality control documents strongly influenced workprograms (the study included approximately 25% auditors with more than 10 years of experience). Results may differ between these participants and others gaining initial audit experience during pre peer review years. The participant questionnaire provided responses to be used as controls for this phenomenon and when these were used as co-variates, no significant differences were found.

Pincus [1991] also warns that experience may produce a confounding effect by way of lack of outcome feedback. She suggests that lack of input into the correctness of decisions may inappropriately increase confidence levels. As such, experienced auditors may be suffering more from lack of outcome feedback, than organization technique or experience level.

Reder and Anderson [1980] warn that mixed results may be found if the task is ill-defined. They posit that differences in recall relate to whether the task is perceived as a consistency task or a specific retrieval task. They also posit that people judge themes (consistency tasks) rather than facts (specific retrieval tasks) and that interference is always present among themes. Reder and Anderson [1980] also imply that the schematic form is better suited for judgment tasks, while the taxonomic form is better suited for recall of specific facts. As such, differences in judgment and recall may be found as an artifact of treatment assignment. An analysis of recall and group treatment and confidence and group treatment did not indicate the presence of either of these conditions.

It is also unclear as to how effective taxonomic and schematic treatment assignment could be. Possibly, as Frederick [1991] indicates, some auditors are more prone to use one form of memory tactic over the other. If this is true, experimental treatments may be confounded. To control for this possibility, results from the untreated control groups were used to partially answer the research questions concerning preference of one memory form over the other. These were compared with the results from the treatment groups. This comparison provided evidence that the treatment was at least partially effective.

Another weakness relates to Chewning and Harrells' [1990] discussion of information overload. They posit that output interference is at its greatest when the task is too large for short term memory. The experimental task in this document exceeds the overload limits discussed by Chewning and Harrell. However, given that the task parallels common audit situations, results are more generalizable than those provided by an smaller less realistic task.

Mandler [1979] provides evidence of another weakness. She indicates that recall may be a function of story structure. Mandler states that in some strong stories, one particular fact is almost always recalled first. If the audit of accounts receivable is considered to be one of these strong stories, then the confirmation procedure may be so highly correlated with the story, that it is constantly recalled in the primacy position. If this type of result is found, then auditor commitment to the confirmation can be more adequately explained.

Future Research

During a reading of the recall strings provided by the seventy participants, it was revealed that different auditors found different procedures to be "most important" or "least important". A frequency analysis might reveal that some types of auditors find certain procedures to be more/less important than others. Characteristics of auditors coding certain steps as "most important" could be

matched with the frequency distributions. Perhaps inexperienced auditors list procedural audit steps as most important, whereas, experienced auditors list decision making steps as most important.

Additionally, evidence that experienced auditors from the control group organized randomly should be explored. It is possible that a schematic and taxonomic representation of knowledge is associated with inexperienced auditors and that experienced auditors use a more dynamic system that represents a "many to many" relationship rather than a "one to one" or "one to many" relationship. If this is the case, experienced auditors may be more efficient when organizing their knowledge in a network type arrangement rather than a hierarchical arrangement.

Additional research involves determining whether confidence in the confirmation procedure is greater during performance of the procedure versus recall of the procedure. At performance time, the auditor may be engulfed in details of their work and may assess an unusually high level of confidence.

Other questions concerning criticisms of the accounts receivable confirmation procedure can also be explored. As several members of the experimental firms pointed out, confirmations may not be used as much as Caster [1992] speculates. Alternatively, the same firms provided participants who listed the accounts receivable confirmation

procedure in almost all cases and indicated that they were an important audit step. A nation-wide survey might be conducted to determine the applicability of the accounts receivable confirmation to the current audit setting.

Alternatively, Hall and Renners' [1991] call for added skepticism may be muted by the present audit setting. Possibly, firm policy, which may highly correlate with audit structure may correlate with an increase in consensus of judgment and a decrease in creativity and hypothesis generation. Most participants in this study indicated that their audits were highly structured. Perhaps answers provided by these participants could be compared with others indicating low audit structure.

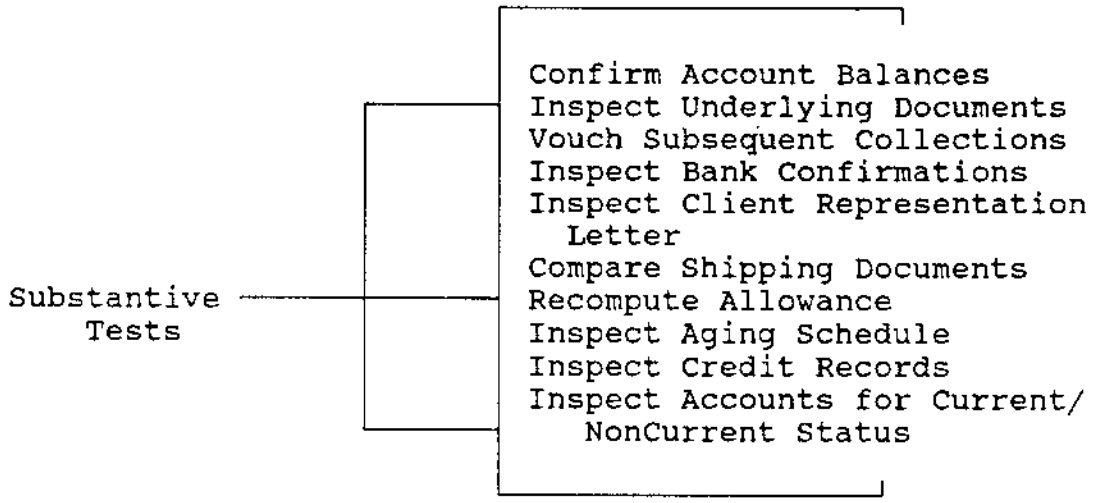
The effects of structure could be expanded into a framework developed by Kruglanski and Freund [1983]. These authors suggest that providing a fear of invalidity to a highly structured task will increase creativity and the ability to think of plausible alternatives. Their theory suggests that high structure causes closure and consensus, while fears of invalidity provide appropriate mitigation. Future research could use this framework to experiment with ways in which auditors might decrease their reliance on fairly structured procedures.

Additionally, results of this proposed experiment can be used to extend Hogarth and Einhorns' [1990] belief adjustment theory. Using the results of this study, it may

be hypothesized that there are instances which predispose the auditor to certain orders of recall strings. If this is the case, individuals recalling strong information in the primacy position, may be most influenced by a string of workprogram steps arranged accordingly and less influenced by those not providing a match.

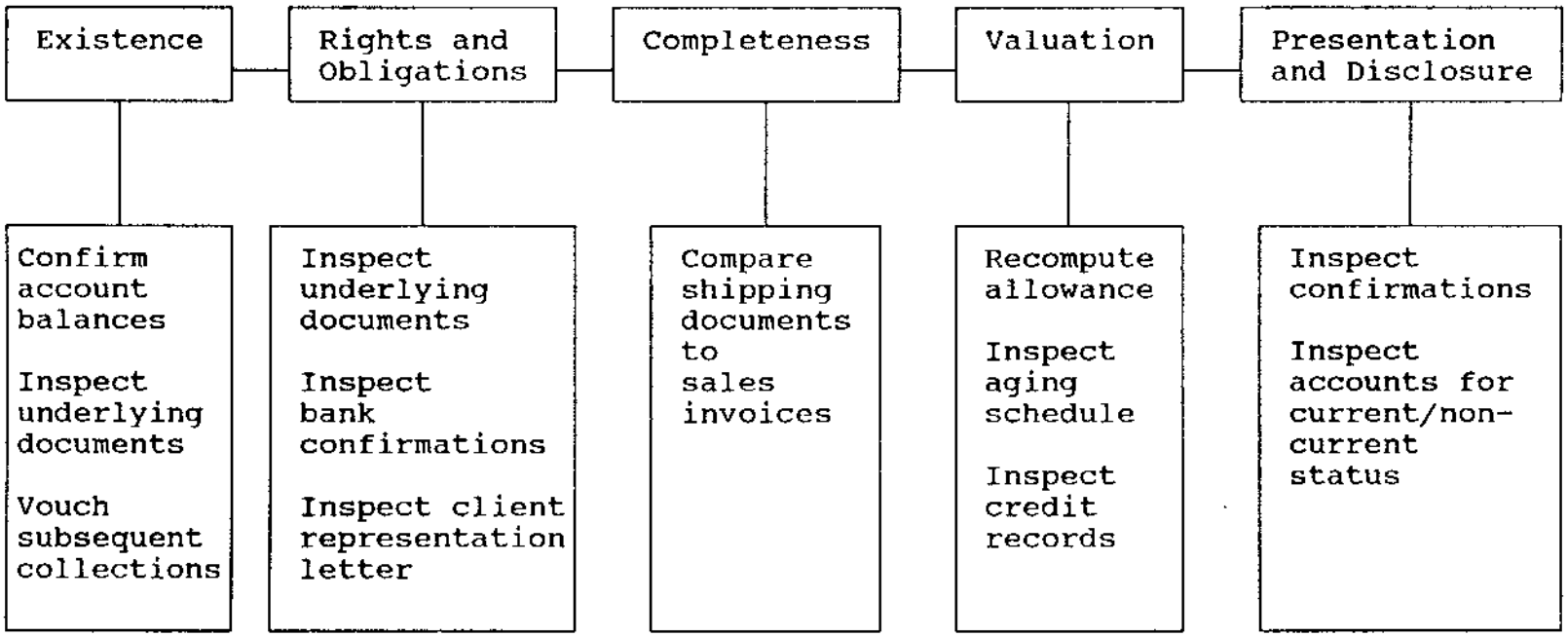
APPENDIX A

Diagram #1
Audit of Accounts Receivable
by Audit Work Program
Schematic Form



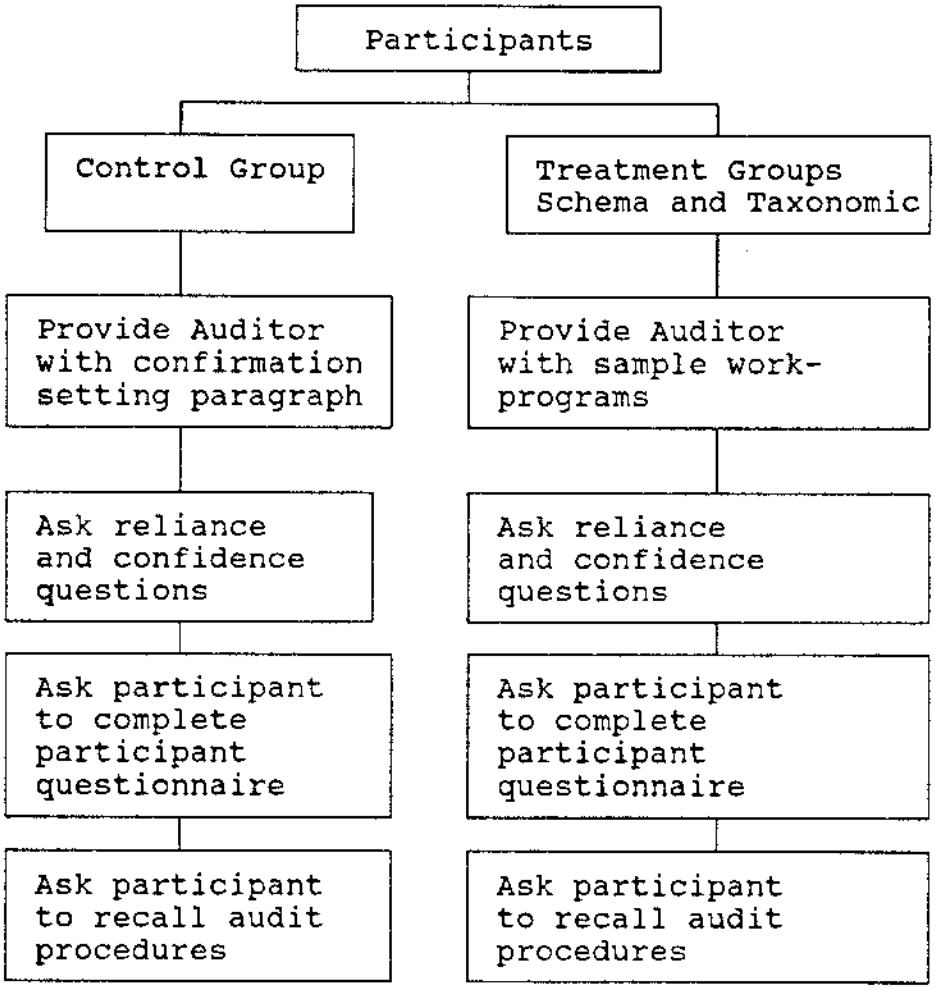
Adapted From: Whittington,
Pany, Meigs and Meigs.
Principles of Auditing, 1992.
and Thomas and Henke, Auditing
Theory and Practice, 1986.

Diagram #2
Audit of Accounts Receivable by Objective/Assertion
Taxonomic Form



Adapted From: Whittington, Pany, Meigs and Meigs Principles of Auditing 1992 and Thomas and Henke Auditing Theory and Practice, 1986.

Diagram #3
Flowchart of Procedures



APPENDIX B

INSTRUMENT FOR CONTROL GROUP

To the Participant:

Thank you for participating in this study. I am performing this study to examine differences in ways in which auditors understand the auditing process. The presented material requests you to make some typical audit judgments and indicate your confidence in those judgments. I believe that all the relevant information is provided to you including a typical accounts receivable audit program along with some background information on an actual company. Even though this may appear to be a lot of material, the process should take no more thirty minutes. There are no right or wrong answers to the questions I ask you. The individual results will remain completely anonymous, and you will not be asked to record your name anywhere. Again, thank you very much for your participation.

Violet Rogers
University of North Texas

General Instructions

You are presented the following material. Please complete the documents per the instructions given below:

1. Document #1 provides a paragraph concerning the audit of accounts receivable. Please read this paragraph and proceed to document #2.

2. Document #2 contains Background Information on Faitoute Steel Company, Inc. Please read this information. You may refer to Document #2 at any time during the completion of the following documents.

3. Document #3 contains several questions concerning the audit of accounts receivable. Answer the questions based on your own experience and the information provided on Faitoute Steel Company.

4. Please complete the Participant Questionnaire (Document #4).

5. Please read and complete Document #5.

6. Please Complete Document #6.

7. Please complete the instructions on Document #7.

Document #1

The substantive test portion of the audit workprogram outlines procedures to be used to gather evidence. The confirmation of accounts receivable is one of these.

Document #2

Background Information[15]

Faitoute Steel Company, Inc., a steel warehousing operation located in Houston, Texas, purchases large quantities of steel from major manufacturers and resells the steel in small quantities and/or sizes. Annual sales are approximately $6,000,000. All of its customers are commercial companies with the exception of occasional sales to government agencies. Most of its customers are small to medium-sized firms located in Texas, Louisiana, and Arkansas. A few customers are quite large and are listed in the Fortune 500. In many respects, the customers are typical of those found on most audits of manufacturers.

A review of the aged accounts receivable trial balance for the fiscal year ended June 30, 1992, revealed the following additional information. There were 335 accounts in total. The balances for approximately 40 percent of the sample represented single billings (one invoice). Approximately one-half of the accounts were classified as "current" (30 days or less past due), and less than three percent of the accounts were 91 or more days old.

An analysis of account balance size revealed that size was distributed normally. The mean balance was $1,624. Faitoute Steel Company Inc. is a recurring client for your firm. Generally speaking, the client has had good internal control, and low audit risk and has received unqualified opinions. Your firm has typically mailed positive accounts receivable confirmations to systematically selected customers.

---

[15] The case was adapted from Caster [1990]. Some of the facts have been changed.

Sample Positive Accounts Receivable Confirmation

(Customer Name)
(Address)

Dear.....

In connection with their regular audit of our financial statements, please confirm directly to our auditors (Auditor Name) the amount of your indebtedness to us which according to our records as of June 30, 1992 amounted to $XXXXX.

If the amount shown is in agreement with your records at that date, please sign in the place provided below and return this letter directly to our auditors in the enclosed envelope.

If the amount is not in agreement with your records, please note the amount shown in your records and any information which may help reconcile the difference on the back of this letter and send it directly to our auditors in the enclosed envelope.

Remittances should not be sent to the auditors.

Sincerely yours,

Client's signature

The above stated amount is correct as of June 30, 1992 with the following exceptions (if any)

.....
.....

.....
(signed by)

.....
(title)

(Please go to the Next Page)

Document #3

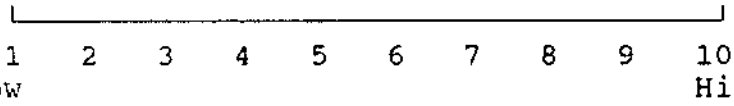
Answer the following questions based upon your own experience, the background information provided on the Faitoute Steel Company and the following audit situation.

Suppose that you performed an adequate mailing of positive confirmations for trade accounts receivable for the Faitoute Steel Company.

1. Based upon your experience in auditing accounts receivable and the information provided on Faitoute Steel Company, What is your estimate of the percentage replies that you would expect to receive?

_____% replies received

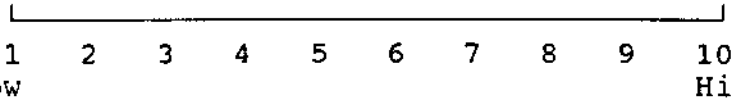
2. How confident are you that your estimate for #1 is accurate? Please estimate your answer by circling a numerical value on the following scale, where 1 equals low confidence and 10 equals high confidence.



3. Based upon your experience in auditing accounts receivable and the information provided on Faitoute Steel Company, What percentage of the received responses do you estimate will be reliable [Assume that "reliable" means that the customer provides a true correct value of the amount owed as of the client year end even though this may disagree with your clients books].

_____% reliable responses

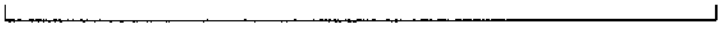
4. How confident are you that your estimate for #3 is accurate? Please estimate your answer by circling a numerical value on the following scale, where 1 equals low confidence and 10 equals high confidence.



5. Assume that your objective is to satisfy the existence assertion for Faitoute Steel Company. Indicate your opinion as to the percentage weight that each of the following procedures should be given.

Accounts Receivable Confirmations	_____%
All Other Procedures	_____%
Total	100%

6. How confident are you that the weighting you provided in question #5 is appropriate for a typical audit situation. Please estimate your answer by circling a numerical value on the following scale, where 1 equals low confidence and 10 equals high confidence.



1 2 3 4 5 6 7 8 9 10
Low High

7. Assume that your objective is to satisfy the valuation assertion for Faitoute Steel Company. Indicate your opinion as to the percentage weight that each of the following procedures should be given.

Accounts Receivable Confirmations	_____%
All Other Procedures	_____%
Total	100%

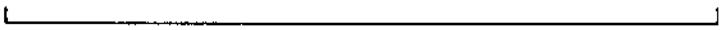
8. How confident are you that the weighting you provided in question #7 is appropriate for a typical audit situation. Please estimate your answer by circling a numerical value on the following scale, where 1 equals low confidence and 10 equals high confidence.

1 2 3 4 5 6 7 8 9 10
Low High

9. Assume that your objective is to satisfy the rights and obligations assertion for Faitoute Steel Company. Indicate your opinion as to the percentage weight that each of the following procedures should be given.

Accounts Receivable Confirmations	_____%
All Other Procedures	_____%
Total	100%

10. How confident are you that the weighting you provided in question #9 is appropriate for a typical audit situation. Please estimate your answer by circling a numerical value on the following scale, where 1 equals low confidence and 10 equals high confidence.



1 2 3 4 5 6 7 8 9 10
Low High

11. How many significant problems (if any) with the accounts receivable confirmation process have you encountered within the last six months?

_____Problems

(Please go to the Next Page)

Document #4

Participant Questionnaire

Indicate the Best Answer

1. How many years experience do you have in public accounting?

   None_____ Under 1 year_____ 1-2 years_____

   3-5 years_____ 6-10 years_____ 11-20 years_____

   Over 20 years_____

2. How many years experience do you have in auditing?

   None_____ Under 1 year_____ 1-2 years_____

   3-5 years_____ 6-10 years_____ 11-20 years_____

   Over 20 years_____

3. How many times have you been directly involved in the audit of accounts receivable?

   None_____ Under 5 times_____ 5-10 times _____

   10-20 times_____ Over 20 times_____

4. How would you describe your most recent involvement in the audit of accounts receivable? (You may check more than one response).

   _____Review the work done by someone else.

   _____Plan the work to be done.

   _____Conduct the substantive tests.

   _____Other (please specify)_____

5. What is your position in your firm?

   Staff Accountant_____ Senior_____ Supervisor_____

   Manager_____ Partner_____ Sole Proprietor_____

   Other (please specify)_____

6. What is the last level of education you completed?

   High School graduate_____
   2-year college graduate_____
   4-year college graduate_____
   Postgraduate work or degree_____

7. Which of the following most closely describes your firm?

   Local CPA firm_____ Regional CPA firm_____

   National CPA firm_____ Other_____

8. Have you worked for other CPA firms?

   Yes_____ No_____

   If so, how would you describe that firm?

   Local CPA firm_____ Regional CPA firm____

   National CPA firm____

9. In your professional career, have you worked for any employer other than a CPA firm?

   Yes_____ No_____

   If so, how would you describe your employer

   Industry_____ Governmental/NonProfit_____

   Financial Institution_____ Service_____

   Other (please specify)_____.

10. Are you a CPA?

    Yes_____ No_____

11. When did you last perform part of an accounts receivable audit task?

    Last Week_____ Last Month_____ 6 Months ago_____

    1 year ago_____ 2 years ago_____

    Over 2 years ago_____

12. What type of client does your firm audit (You may check more than one)?

Small Businesses_____ Mid-Size Companies_____

SEC clients_____ Governmental/NonProfit clients_____

Financial Institutions_____ Service_____

Other (Please specify)_____

13. Are you actively involved in assessing audit risk?

Yes_____ No _____

14. Which of the following describes your firm's approach to workprograms?

_____Standard workprograms are used on each engagement.
_____Standard workprograms are often used.
_____Standard workprograms are sometimes used.
_____Standard workprograms are seldom used.
_____Standard workprograms are never used.
_____Other (Please specify)_____

15. In your recent memory, have you heard or seen any articles about:

_____the benefits of using accounts receivable confirmations.

_____the problems associated with using accounts receivable confirmations.

Document #5

Imagine that as part of your job responsibilities you are asked to help choose between several potential clients. Your firm has only a limited number of chargeable hours and the partners insist that only one choice can be handled by the firm. You consider four possibilities. All include companies that are similar to clients you already service except for the amount of fees generated and the possibility of providing work for other staffs. To compare the four jobs, you have made up the following descriptions.

Present client

The present client has been with your firm for two years. Typically, a portion of the audit fee has been written off. But, the client is very prestigious. Fees generated from this client are $100,000.

Client Package A

This potential client is also very prestigious, but is considered to have a better internal control system than your present client. As such, it seems unlikely that your firm will suffer a write off of part of the audit fee. The fee expected to be generated from this client is $125,000. If you accept this client, you cannot retain your present client.

Client Package B

This client is also very prestigious, is considered to have a better internal control system than your present client, and would generate even more revenue for your firm. The audit fee is expected to be $250,000. Given their internal control system, and your firms commitment to quality, it seems unlikely that your firm will have to write off part of the audit fee. As part of your normal procedures regarding acceptance and continuation of clients, you found out that this client changes auditors almost every year. After interviewing this potential client, they state that the reason for this change is that they are searching for a quality audit product. If you accept this client, you cannot retain your present client.

Client Package C

This could be your firms most prestigious client in the future. They are clearly a growth company and need your firms assistance in all facets including MAS, Tax, and Auditing. Currently your audit staff is overworked, and the MAS and TAX staff have an excess of non-chargeable time. If you accept this client much overtime will be eliminated for the audit staff, and additional work will be provided for the Tax and MAS staff, thus eliminating a portion of their underproductive time. The expected fee is $100,000 with no write off. If you accept this client you cannot retain your present client.

Use the following chart to indicate your ranking of your choice between your present client, client package A, client package B, and client package C. Place a (1) beside your first choice, a (2) beside your second choice, a (3) beside your third choice and a (4) beside your fourth choice.

_____Present Client

_____Client Package A

_____Client Package B

_____Client Package C

(Please go to the Next Page)

Document #6

List as many substantive test procedures for the audit of accounts receivable as you can.

1.

2.

3.

4.

5.

6.

7.

8.

9.

10.

11.

12.

13.

14.

15.

16.

Document #7

Use your own words and write a short sentence or paragraph defining the audit objective as it relates to accounts receivable.

Look back at your recall of procedures on the preceding page. Beside each procedure that you listed indicate your opinion as to whether each of these is (1) a very important step in fulfilling the audit objective, (2) a somewhat important step in fulfilling the audit objective or (3) an unimportant step in fulfilling the audit objective.

APPENDIX C

INSTRUMENT FOR SCHEMATIC GROUP

To the Participant:

Thank you for participating in this study. I am performing this study to examine differences in ways in which auditors understand the auditing process. The presented material requests you to make some typical audit judgments and indicate your confidence in those judgments. I believe that all the relevant information is provided to you including a typical accounts receivable audit program along with some background information on an actual company. Even though this may appear to be a lot of material, the process should take no more thirty minutes. There are no right or wrong answers to the questions I ask you. The individual results will remain completely anonymous, and you will not be asked to record your name anywhere. Again, thank you very much for your participation.

Violet Rogers
University of North Texas

General Instructions

You are presented the following material. Please complete the documents per the instructions given below:

1. Document #1 represents a sample audit workprogram for accounts receivables. You will be given time to carefully read this document. After you have read the document, it will be collected and you will not be allowed to refer to it again.

2. Document #2 contains Background Information on Faitoute Steel Company, Inc. Please read this information. You may refer to Document #2 at any time during the completion of the following documents.

3. Document #3 contains several questions concerning the audit of accounts receivable. Answer the questions based on your own experience and the information provided on Faitoute Steel Company.

4. Please complete the Participant Questionnaire (Document #4).

5. Please read and complete Document #5.

6. Please Complete Document #6.

7. Please complete the instructions on Document #7.

Document #1

The AICPA states that the objective of an audit is to express an opinion on whether financial statements present fairly in all material respects, an entity's financial position, results of operations, and cash flows in conformity with generally accepted accounting principles. The substantive test portion of the audit workprogram outlines procedures that the auditor plans to use to gather evidence that will be used to formulate such an opinion. Listed below are standard substantive workprogram procedures for the audit of accounts receivable. Please read the following carefully.

1. Review activity in the general ledger control accounts for trade accounts receivable for the period being audited.

2. Analyze the relationship of receivables and sales and compare with relationships for the preceding periods.

3. Obtain or prepare an aged trial balance of trade receivables as of the date selected for confirmation procedures.

4. Select individual customer accounts for confirmation procedures.

5. Subsequent to the confirmation date, trace individual confirmation requests to the subsidiary accounts receivable records, obtain explanations for any accounts that the client requests be excluded from the confirmation procedure and send second requests.

6. Perform alternative auditing procedures for unanswered positive confirmation requests.

7. Test items subsequently paid to remittance advices which identify the specific invoices paid.

8. Examine customer's purchase orders, related invoices and shipping documents for amounts that are not supported by remittance advices which identify the specific invoices paid.

9. Establish the existence of the customer by reference to such sources such as Dun and Bradstreet Reference Book.

10. If accounts receivable were confirmed as of a date other than the balance sheet date, obtain an analysis of transactions between the confirmation and balance sheet dates, trace amounts to books of original entry, and review the analysis and books for significant unusual entries.

11. Ascertain whether any accounts receivable have been assigned, pledged or discounted by reference to minutes, review of agreements, confirmation with banks, etc.

12. Ascertain whether any accounts or notes receivable are owed by employees or related parties such as officers, directors, shareholders, and affiliates.

13. Obtain or prepare an analysis of the allowance for doubtful accounts for the period and review accounts written off during the period.

14. Determine that significant write-offs have been properly authorized.

15. Review adequacy of the allowance.

16. Inspect accounts for current/non-current status.

(This document will be taken up by the experimenter)

Document #2

Background Information[16]

Faitoute Steel Company, Inc., a steel warehousing operation located in Houston, Texas, purchases large quantities of steel from major manufacturers and resells the steel in small quantities and/or sizes. Annual sales are approximately $6,000,000. All of its customers are commercial companies with the exception of occasional sales to government agencies. Most of its customers are small to medium-sized firms located in Texas, Louisiana, and Arkansas. A few customers are quite large and are listed in the Fortune 500. In many respects, the customers are typical of those found on most audits of manufacturers.

A review of the aged accounts receivable trial balance for the fiscal year ended June 30, 1992, revealed the following additional information. There were 335 accounts in total. The balances for approximately 40 percent of the sample represented single billings (one invoice). Approximately one-half of the accounts were classified as "current" (30 days or less past due), and less than three percent of the accounts were 91 or more days old.

An analysis of account balance size revealed that size was distributed normally. The mean balance was $1,624. Faitoute Steel Company Inc. is a recurring client for your firm. Generally speaking, the client has had good internal control, and low audit risk and has received unqualified opinions. Your firm has typically mailed positive accounts receivable confirmations to systematically selected customers.

---

[16] The case was adapted from Caster [1990]. Some of the facts have been changed.

Sample Positive Accounts Receivable Confirmation

(Customer Name)
(Address)

Dear.....

In connection with their regular audit of our financial statements, please confirm directly to our auditors (Auditor Name) the amount of your indebtedness to us which according to our records as of June 30, 1992 amounted to $XXXXX.

If the amount shown is in agreement with your records at that date, please sign in the place provided below and return this letter directly to our auditors in the enclosed envelope.

If the amount is not in agreement with your records, please note the amount shown in your records and any information which may help reconcile the difference on the back of this letter and send it directly to our auditors in the enclosed envelope.

Remittances should not be sent to the auditors.

Sincerely yours,

Client's signature

The above stated amount is correct as of June 30, 1992 with the following exceptions (if any)

.....
.....

.....
(signed by)

.....
(title)

(Please go to the Next Page)

Document #3

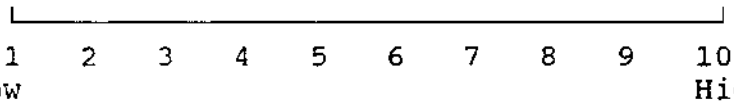
Answer the following questions based upon your own experience, the background information provided on the Faitoute Steel Company and the following audit situation.

Suppose that you performed an adequate mailing of positive confirmations for trade accounts receivable for the Faitoute Steel Company.

1. Based upon your experience in auditing accounts receivable and the information provided on Faitoute Steel Company, What is your estimate of the percentage replies that you would expect to receive?

_____% replies received

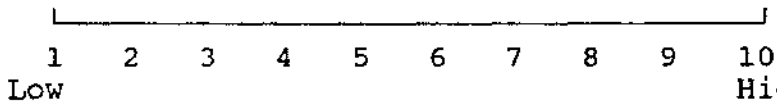
2. How confident are you that your estimate for #1 is accurate? Please estimate your answer by circling a numerical value on the following scale, where 1 equals low confidence and 10 equals high confidence.



3. Based upon your experience in auditing accounts receivable and the information provided on Faitoute Steel Company, What percentage of the received responses do you estimate will be reliable [Assume that "reliable" means that the customer provides a true correct value of the amount owed as of the client year end even though this may disagree with your clients books].

_____% reliable responses

4. How confident are you that your estimate for #3 is accurate? Please estimate your answer by circling a numerical value on the following scale, where 1 equals low confidence and 10 equals high confidence.

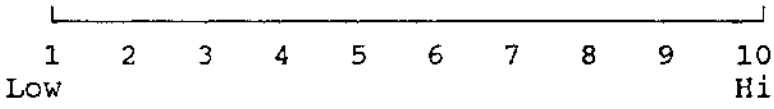


5. Assume that your objective is to satisfy the existence assertion (i.e. reported receivables actually exist) for Faitoute Steel Company. Indicate your opinion as to the percentage weight that each of the following procedures should be given.

Accounts Receivable Confirmations_____%
All Other Procedures _____%

Total 100%

6. How confident are you that the weighting you provided in question #5 is appropriate for a typical audit situation. Please estimate your answer by circling a numerical value on the following scale, where 1 equals low confidence and 10 equals high confidence.

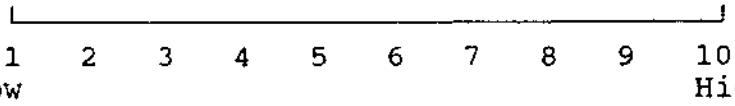


7. Assume that your objective is to satisfy the valuation assertion (i.e. reported receivables are valued properly) for Faitoute Steel Company. Indicate your opinion as to the percentage weight that each of the following procedures should be given.

Accounts Receivable Confirmations_____%
All Other Procedures _____%

Total 100%

8. How confident are you that the weighting you provided in question #7 is appropriate for a typical audit situation. Please estimate your answer by circling a numerical value on the following scale, where 1 equals low confidence and 10 equals high confidence.

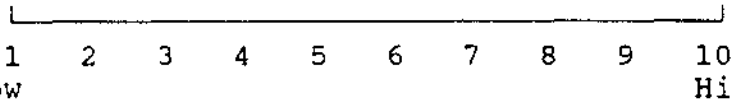


9. Assume that your objective is to satisfy the rights and obligations assertion (i.e. reported receivables are owned by the company) for Faitoute Steel Company. Indicate your opinion as to the percentage weight that each of the following procedures should be given.

Accounts Receivable Confirmations_____%
All Other Procedures _____%

Total 100%

10. How confident are you that the weighting you provided in question #9 is appropriate for a typical audit situation. Please estimate your answer by circling a numerical value on the following scale, where 1 equals low confidence and 10 equals high confidence.



11. How many significant problems (if any) with the accounts receivable confirmation process have you encountered within the last six months?

_____Problems

(Please go to the Next Page)

Document #4

Participant Questionnaire

Indicate the Best Answer

1. How many years experience do you have in public accounting?

   None_____ Under 1 year_____ 1-2 years_____

   3-5 years_____ 6-10 years_____ 11-20 years_____

   Over 20 years_____

2. How many years experience do you have in auditing?

   None_____ Under 1 year_____ 1-2 years_____

   3-5 years_____ 6-10 years_____ 11-20 years_____

   Over 20 years_____

3. How many times have you been directly involved in the audit of accounts receivable?

   None_____ Under 5 times_____ 5-10 times _____

   10-20 times_____ Over 20 times_____

4. How would you describe your most recent involvement in the audit of accounts receivable? (You may check more than one response).

   _____Review the work done by someone else.

   _____Plan the work to be done.

   _____Conduct the substantive tests.

   _____Other (please specify)_____

5. What is your position in your firm?

   Staff Accountant_____ Senior_____ Supervisor_____

   Manager_____ Partner_____ Sole Proprietor_____

   Other (please specify)_____

6. What is the last level of education you completed?

   High School graduate_____
   2-year college graduate_____
   4-year college graduate_____
   Postgraduate work or degree_____

7. Which of the following most closely describes your firm?

   Local CPA firm_____ Regional CPA firm_____

   National CPA firm_____ Other_____

8. Have you worked for other CPA firms?

   Yes_____ No_____

   If so, how would you describe that firm?

   Local CPA firm_____ Regional CPA firm____

   National CPA firm____

9. In your professional career, have you worked for any employer other than a CPA firm?

   Yes_____ No_____

   If so, how would you describe your employer

   Industry_____ Governmental/NonProfit_____

   Financial Institution_____ Service_____

   Other (please specify)_____

10. Are you a CPA?

    Yes_____ No_____

11. When did you last perform part of an accounts receivable audit task?

    Last Week_____ Last Month_____ 6 Months ago_____

    1 year ago_____ 2 years ago_____

    Over 2 years ago_____

12. What type of client does your firm audit (You may check more than one)?

Small Businesses_____ Mid-Size Companies_____

SEC clients_____ Governmental/NonProfit clients_____

Financial Institutions_____ Service_____

Other (Please specify)_____

13. Are you actively involved in assessing audit risk?

Yes_____ No _____

14. Which of the following describes your firm's approach to workprograms?

_____Standard workprograms are used on each engagement.
_____Standard workprograms are often used.
_____Standard workprograms are sometimes used.
_____Standard workprograms are seldom used.
_____Standard workprograms are never used.
_____Other (Please specify)_____

15. In your recent memory, have you heard or seen any articles about:

_____the benefits of using accounts receivable confirmations.

_____the problems associated with using accounts receivable confirmations.

Document #5

Imagine that as part of your job responsibilities you are asked to help choose between several potential clients. Your firm has only a limited number of chargeable hours and the partners insist that only one choice can be handled by the firm. You consider four possibilities. All include companies that are similar to clients you already service except for the amount of fees generated and the possibility of providing work for other staffs. To compare the four jobs, you have made up the following descriptions.

Present client

The present client has been with your firm for two years. Typically, a portion of the audit fee has been written off. But, the client is very prestigious. Fees generated from this client are $100,000.

Client Package A

This potential client is also very prestigious, but is considered to have a better internal control system than your present client. As such, it seems unlikely that your firm will suffer a write off of part of the audit fee. The fee expected to be generated from this client is $125,000. If you accept this client, you cannot retain your present client.

Client Package B

This client is also very prestigious, is considered to have a better internal control system than your present client, and would generate even more revenue for your firm. The audit fee is expected to be $250,000. Given their internal control system, and your firms commitment to quality, it seems unlikely that your firm will have to write off part of the audit fee. As part of your normal procedures regarding acceptance and continuation of clients, you found out that this client changes auditors almost every year. After interviewing this potential client, they state that the reason for this change is that they are searching for a quality audit product. If you accept this client, you cannot retain your present client.

Client Package C

This could be your firms most prestigious client in the future. They are clearly a growth company and need your firms assistance in all facets including MAS, Tax, and Auditing. Currently your audit staff is overworked, and the MAS and TAX staff have an excess of non-chargeable time. If you accept this client much overtime will be eliminated for the audit staff, and additional work will be provided for the Tax and MAS staff, thus eliminating a portion of their underproductive time. The expected fee is $100,000 with no write off. If you accept this client you cannot retain your present client.

Use the following chart to indicate your ranking of your choice between the present client, client package A, client package B, and client package C. Place a (1) beside your first choice, a (2) beside your second choice, a (3) beside your third choice, and a (4) beside your fourth choice.

_____Present Client

_____Client Package A

_____Client Package B

_____Client Package C

(Please go to the Next Page)

Document #6

List as many substantive test procedures for the audit of accounts receivable as you can.

1.

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16.

Document #7

The AICPA states that the audit objective is to express an opinion on whether financial statements present fairly in all material respects, an entity's financial position, results of operations, and cash flows in conformity with generally accepted accounting principles.

Look back at your recall of procedures on the preceding page. Beside each procedure that you listed indicate your opinion as to whether each of these is (1) a very important step in fulfilling the audit objective, (2) a somewhat important step in fulfilling the audit objective or (3) an unimportant step in fulfilling the audit objective.

APPENDIX D

INSTRUMENT FOR TAXONOMIC GROUP

To the Participant:

Thank you for participating in this study. I am performing this study to examine differences in ways in which auditors understand the auditing process. The presented material requests you to make some typical audit judgments and indicate your confidence in those judgments. I believe that all the relevant information is provided to you including a typical accounts receivable audit program along with some background information on an actual company. Even though this may appear to be a lot of material, the process should take no more thirty minutes. There are no right or wrong answers to the questions I ask you. The individual results will remain completely anonymous, and you will not be asked to record your name anywhere. Again, thank you very much for your participation.

Violet Rogers
University of North Texas

General Instructions

You are presented the following material. Please complete the documents per the instructions given below:

1. Document #1 represents a sample audit workprogram for accounts receivables. You will be given time to carefully read this document. After you have read the document, it will be collected and you will not be allowed to refer to it again.

2. Document #2 contains Background Information on Faitoute Steel Company, Inc. Please read this information. You may refer to Document #2 at any time during the completion of the following documents.

3. Document #3 contains several questions concerning the audit of accounts receivable. Answer the questions based on your own experience and the information provided on Faitoute Steel Company.

4. Please complete the Participant Questionnaire (Document #4).

5. Please read and complete Document #5.

6. Please Complete Document #6.

7. Please complete the instructions on Document #7.

Document #1

According to SAS no. 31, Evidential Matter (AU section 326), the independent auditor's work in forming an opinion on financial statements consists of obtaining and evaluating evidential matter concerning the assertions in such financial statements. These assertions are embodied in the account balance, transaction class, and disclosure components of financial statements and are classified according to the following broad categories:

a. existence
b. completeness
c. rights and obligations
d. valuation
e. presentation and disclosure

The substantive test portion of the audit workprogram outlines procedures to be used to gather evidence to evaluate the five assertions. Listed below are standard workprogram procedures, organized by assertion, for the audit of accounts receivable. The following examples are not intended to be all-inclusive nor is it expected that all of the procedures would be applied in an audit. Please carefully read the following.

A. Existence Assertion

1. Select Individual customer accounts for confirmation procedures.

2. Perform alternative auditing procedures for unanswered positive confirmation requests.

3. Test items subsequently paid to remittance advices which identify the specific invoices paid.

4. Establish the existence of the customer by reference to such sources as Dun and Bradstreet Reference book.

5. Subsequent to the confirmation date, trace individual confirmation requests to the subsidiary accounts receivable records, obtain explanations for any accounts that the client requests be excluded from the confirmation procedure and send second requests.

6. If accounts receivable were confirmed as of a date other than the balance sheet date, obtain an analysis of transactions between the confirmation and balance sheet dates, trace amounts to books of original entry, and review the analysis and books for significant unusual entries.

B. Completeness Assertion

1. Examine customer's purchase orders, related invoices and shipping documents for amounts that are not supported by remittance advices which identify the specific invoices paid.

2. Analyze the relationship of receivables and sales and compare with relationships for the preceding periods.

C. Rights and Obligations Assertion

1. Ascertain whether any accounts receivable have been assigned, pledged or discounted by reference to minutes, review of agreements, confirmation with banks, etc.

2. Ascertain whether any accounts or notes receivable are owed by employees or related parties such as officers, directors, and affiliates.

D. Valuation Assertion

1. Obtain or prepare an aged trial balance of trade receivables as of the date selected for confirmation procedures.

2. Obtain or prepare an analysis of the allowance for doubtful accounts for the period and review accounts written off during the period.

3. Determine that significant write-offs have been properly authorized.

4. Review adequacy of the allowance for doubtful accounts amount.

E. Presentation and Disclosure Assertion

1. Inspect accounts for current/non-current status.

2. Review activity in the general ledger control accounts for trade accounts receivable for the period being audited.

Document #2

Background Information[17]

Faitoute Steel Company, Inc., a steel warehousing operation located in Houston, Texas, purchases large quantities of steel from major manufacturers and resells the steel in small quantities and/or sizes. Annual sales are approximately $6,000,000. All of its customers are commercial companies with the exception of occasional sales to government agencies. Most of its customers are small to medium-sized firms located in Texas, Louisiana, and Arkansas. A few customers are quite large and are listed in the Fortune 500. In many respects, the customers are typical of those found on most audits of manufacturers.

A review of the aged accounts receivable trial balance for the fiscal year ended June 30, 1992, revealed the following additional information. There were 335 accounts in total. The balances for approximately 40 percent of the sample represented single billings (one invoice). Approximately one-half of the accounts were classified as "current" (30 days or less past due), and less than three percent of the accounts were 91 or more days old.

An analysis of account balance size revealed that size was distributed normally. The mean balance was $1,624. Faitoute Steel Company Inc. is a recurring client for your firm. Generally speaking, the client has had good internal control, and low audit risk and has received unqualified opinions. Your firm has typically mailed positive accounts receivable confirmations to systematically selected customers.

---

[17] The case is adapted from Caster [1990]. Some of the facts have been changed.

Sample Positive Accounts Receivable Confirmation

(Customer Name)
(Address)

Dear.....

In connection with their regular audit of our financial statements, please confirm directly to our auditors (Auditor Name) the amount of your indebtedness to us which according to our records as of June 30, 1992 amounted to $XXXXX.

If the amount shown is in agreement with your records at that date, please sign in the place provided below and return this letter directly to our auditors in the enclosed envelope.

If the amount is not in agreement with your records, please note the amount shown in your records and any information which may help reconcile the difference on the back of this letter and send it directly to our auditors in the enclosed envelope.

Remittances should not be sent to the auditors.

Sincerely yours,

Client's signature

The above stated amount is correct as of June 30, 1992 with the following exceptions (if any)

.....
.....

.....
(signed by)

.....
(title)

(Please go to the Next Page)

Document #3

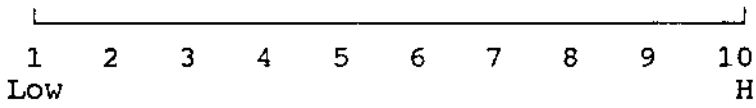
Answer the following questions based upon your own experience, the background information provided on the Faitoute Steel Company and the following audit situation.

Suppose that you performed an adequate mailing of positive confirmations for trade accounts receivable for the Faitoute Steel Company.

1. Based upon your experience in auditing accounts receivable and the information provided on Faitoute Steel Company, What is your estimate of the percentage replies that you would expect to receive?

_____% replies received

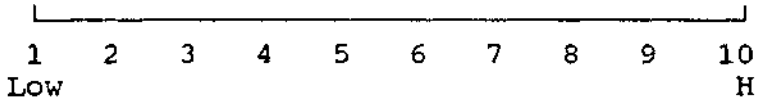
2. How confident are you that your estimate for #1 is accurate? Please estimate your answer by circling a numerical value on the following scale, where 1 equals low confidence and 10 equals high confidence.



3. Based upon your experience in auditing accounts receivable and the information provided on Faitoute Steel Company, What percentage of the received responses do you estimate will be reliable [Assume that "reliable" means that the customer provides a true correct value of the amount owed as of the client year end even though this may disagree with your clients books].

_____% reliable responses

4. How confident are you that your estimate for #3 is accurate? Please estimate your answer by circling a numerical value on the following scale, where 1 equals low confidence and 10 equals high confidence.



5. Assume that your objective is to satisfy the existence assertion for Faitoute Steel Company. Indicate your opinion as to the percentage weight that each of the following procedures should be given.

Accounts Receivable Confirmations_____%
All Other Procedures _____%

Total 100%

6. How confident are you that the weighting you provided in question #5 is appropriate for a typical audit situation. Please estimate your answer by circling a numerical value on the following scale, where 1 equals low confidence and 10 equals high confidence.

1 2 3 4 5 6 7 8 9 10
Low High

7. Assume that your objective is to satisfy the valuation assertion for Faitoute Steel Company. Indicate your opinion as to the percentage weight that each of the following procedures should be given.

Accounts Receivable Confirmations_____%
All Other Procedures _____%

Total 100%

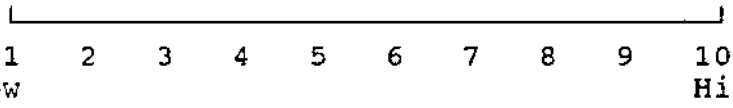
8. How confident are you that the weighting you provided in question #7 is appropriate for a typical audit situation. Please estimate your answer by circling a numerical value on the following scale, where 1 equals low confidence and 10 equals high confidence.

1 2 3 4 5 6 7 8 9 10
Low High

9. Assume that your objective is to satisfy the rights and obligations assertion for Faitoute Steel Company. Indicate your opinion as to the percentage weight that each of the following procedures should be given.

Accounts Receivable Confirmations	_____%
All Other Procedures	_____%
Total	100%

10. How confident are you that the weighting you provided in question #9 is appropriate for a typical audit situation. Please estimate your answer by circling a numerical value on the following scale, where 1 equals low confidence and 10 equals high confidence.



11. How many significant problems (if any) with the accounts receivable confirmation process have you encountered within the last six months?

_____Problems

(Please go to the Next Page)

Document #4

Participant Questionnaire

Indicate the Best Answer

1. How many years experience do you have in public accounting?

   None_____ Under 1 year_____ 1-2 years_____

   3-5 years_____ 6-10 years_____ 11-20 years_____

   Over 20 years_____

2. How many years experience do you have in auditing?

   None_____ Under 1 year_____ 1-2 years_____

   3-5 years_____ 6-10 years_____ 11-20 years_____

   Over 20 years_____

3. How many times have you been directly involved in the audit of accounts receivable?

   None_____ Under 5 times_____ 5-10 times _____

   10-20 times_____ Over 20 times_____

4. How would you describe your most recent involvement in the audit of accounts receivable? (You may check more than one response).

   _____Review the work done by someone else.

   _____Plan the work to be done.

   _____Conduct the substantive tests.

   _____Other (please specify)_____

5. What is your position in your firm?

   Staff Accountant_____ Senior_____ Supervisor_____

   Manager_____ Partner_____ Sole Proprietor_____

   Other (please specify)_____

6. What is the last level of education you completed?

   High School graduate_____
   2-year college graduate_____
   4-year college graduate_____
   Postgraduate work or degree_____

7. Which of the following most closely describes your firm?

   Local CPA firm_____ Regional CPA firm_____

   National CPA firm_____ Other_____

8. Have you worked for other CPA firms?

   Yes_____ No_____

   If so, how would you describe that firm?

   Local CPA firm_____ Regional CPA firm____

   National CPA firm____

9. In your professional career, have you worked for any employer other than a CPA firm?

   Yes_____ No_____

   If so, how would you describe your employer

   Industry_____ Governmental/NonProfit_____

   Financial Institution_____ Service_____

   Other (please specify)_____.

10. Are you a CPA?

    Yes_____ No_____

11. When did you last perform part of an accounts receivable audit task?

    Last Week_____ Last Month_____ 6 Months ago_____

    1 year ago_____ 2 years ago_____

    Over 2 years ago_____

12. What type of client does your firm audit (You may check more than one)?

Small Businesses_____ Mid-Size Companies_____

SEC clients_____ Governmental/NonProfit clients_____

Financial Institutions_____ Service_____

Other (Please specify)_____

13. Are you actively involved in assessing audit risk?

Yes_____ No _____

14. Which of the following describes your firm's approach to workprograms?

_____Standard workprograms are used on each engagement.
_____Standard workprograms are often used.
_____Standard workprograms are sometimes used.
_____Standard workprograms are seldom used.
_____Standard workprograms are never used.
_____Other (Please specify)_____

15. In your recent memory, have you heard or seen any articles about:

_____the benefits of using accounts receivable confirmations.

_____the problems associated with using accounts receivable confirmations.

Document #5

Imagine that as part of your job responsibilities you are asked to help choose between several potential clients. Your firm has only a limited number of chargeable hours and the partners insist that only one choice can be handled by the firm. You consider four possibilities. All include companies that are similar to clients you already service except for the amount of fees generated and the possibility of providing work for other staffs. To compare the four jobs, you have made up the following descriptions.

Present client

The present client has been with your firm for two years. Typically, a portion of the audit fee has been written off. But, the client is very prestigious. Fees generated from this client are $100,000.

Client Package A

This potential client is also very prestigious, but is considered to have a better internal control system than your present client. As such, it seems unlikely that your firm will suffer a write off of part of the audit fee. The fee expected to be generated from this client is $125,000. If you accept this client, you cannot retain your present client.

Client Package B

This client is also very prestigious, is considered to have a better internal control system than your present client, and would generate even more revenue for your firm. The audit fee is expected to be $250,000. Given their internal control system, and your firms commitment to quality, it seems unlikely that your firm will have to write off part of the audit fee. As part of your normal procedures regarding acceptance and continuation of clients, you found out that this client changes auditors almost every year. After interviewing this potential client, they state that the reason for this change is that they are searching for a quality audit product. If you accept this client, you cannot retain your present client.

Client Package C

This could be your firms most prestigious client in the future. They are clearly a growth company and need your firms assistance in all facets including MAS, Tax, and Auditing. Currently your audit staff is overworked, and the MAS and TAX staff have an excess of non-chargeable time. If you accept this client much overtime will be eliminated for the audit staff, and additional work will be provided for the Tax and MAS staff, thus eliminating a portion of their underproductive time. The expected fee is $100,000 with no write off. If you accept this client you cannot retain your present client.

Use the following chart to indicate your ranking of your choice between the present client, client package A, client package B, and client package C. Place a (1) beside your first choice, a (2) beside your second choice, a (3) beside your third choice, and a (4) beside your fourth choice.

_____Present Client

_____Client Package A

_____Client Package B

_____Client Package C

(Please go to the Next Page)

Document #6

List as many substantive test procedures for the audit of accounts receivable as you can.

1.

2.

3.

4.

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9.

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14.

15.

16.

Document #7

According to SAS no. 31, Evidential Matter (AU section 326), the independent auditor's objective is to form an opinion on financial statements by obtaining and evaluating evidential matter concerning the assertions in such financial statements.

Look back at your recall of procedures on the preceding page. **Assume that your primary audit objective is to satisfy the financial statement assertions.** Beside each procedure that you listed, indicate your opinion as to whether each of these is (1) a very important step in fulfilling the audit objective, (2) a somewhat important step in fulfilling the audit objective or (3) an unimportant step in fulfilling the audit objective.

APPENDIX E

Introduction Script

I have provided a booklet of information for you to use in this experiment. The first page is a thank you letter that briefly describes my purpose of conducting the experiment. The second page is made up of directions. These directions state the procedures that you are expected to follow.

The page or pages of document #1 are not bound in your booklet. You will be given an opportunity to carefully read these. After that reading period, I will collect these loose pages and then you may proceed to Document #2.

Document #2 (as stated in the instructions) consists of some background information on a recurring client. You may refer back to this document at any time.

After reading Document #2, you will be allowed to complete the rest of the documents in the order that they are provided to you. When you have completed the experiment (the documents), I will give you a brief summary of my expected results.

Thanks again for participating. Your first task is to read document #1. For some of you, that document is only one paragraph. For many others, Document #1 consists of 2 pages. When you finish reading Document #1, place it face down on the table. I will come by and pick it up. When you place it face down, you may proceed to the rest of the experiment at your own pace. When you finish, I will begin the debriefing session.

Exit Script

Again, thank you for participating in this study. The primary purpose of this research is to examine differences in the ways that different groups of auditors think about auditing tasks. Specifically, this research is designed to assess these differences in relation to the accounts receivable confirmation process. This area was chosen, because, recently, the confirmation procedure has come under close scrutiny. Critics claim that auditors are auditing mechanically, and that they do not realize or care that the confirmation procedure is flawed.

A total of 92 participants are being used for this study. The participants are randomly divided into members of a schema treatment group (routine in laymans terms), a taxonomic treatment group (categorical or by assertion), and a control group. Members of the schema treatment group (or routine group) received an instrument that designs the workprograms in a somewhat temporal fashion. Members of the taxonomic (categorical group) received an instrument that designed the workprograms by assertion. Members of the control group received only a short paragraph with no workprograms.

The objective of providing differently organized data to some of you is access how different levels of experienced auditors respond to different designs or orders of workprograms. The objective of the control group was to assess how different levels of experienced auditors naturally organize auditing procedures.

To gather your responses, all of you were given some background information on a typical audit client, and then asked some specific questions about reliability and confidence. You were then presented with some information on acceptance and continuation of clients. This was designed as a distractor task. Hopefully, it served to clear short term memory or to get your mind off the task at hand. This data will be used in another study concerning the endowment effect of auditors, wherein, some groups may prove to be low risk takers and more or less demonstrate that losses loom larger than gains. The questions concerning confirmation reliability and confidence were designed to assess differences in your opinion as to those factors.

Means and Standard Deviations for Questions From Document #3 and Document #4

Variable	N	Mean	Std Dev
Q1	70	74.6571429	16.2622402
Q2	70	60.4285714	24.4614879
Q3	70	82.0428571	13.3995844
Q4	70	59.3571429	23.2802932
Q5	70	69.3857143	23.9106385
Q6	70	59.4142857	26.4018515
Q7	70	54.5000000	25.2975052
Q8	70	60.9857143	24.0630168
Q9	70	54.2571429	31.9821897
Q10	70	60.0000000	24.4356594
EXPPUB	70	5.4714286	7.0643449
EXPYRS	70	4.9285714	6.5437689
EXPNUM	70	9.3571429	8.9572830
RECALL	70	8.6142857	9.4490132
C1	70	300.1857143	108.6347814

Group Means and Standard Deviations

Variable	Control Group Mean (Std. Dev)	Schema Group Mean (Std. Dev)	Tax. Group Mean (Std. Dev)
N	22	26	22
Q1	72.50 (15.17)	75.77 (17.36)	75.50 (16.51)
Q2	62.72 (22.51)	60.00 (26.08)	58.63 (25.32)
Q3	79.91 (15.46)	83.69 (13.84)	82.23 (10.69)
Q4	60.00 (24.30)	56.92 (24.29)	61.59 (21.79)
Q5	70.59 (25.82)	65.15 (27.02)	73.18 (17.42)
Q6	61.77 (27.99)	57.31 (25.23)	59.54 (27.16)
Q7	44.32 (24.51)	55.96 (26.15)	62.95 (22.39)
Q8	61.82 (24.42)	60.00 (23.66)	61.31 (25.24)
Q9	70.55 (25.54)	48.65 (31.76)	44.59 (33.05)
Q10	65.45 (24.83)	56.92 (24.29)	58.18 (24.42)
EXPPUB	5.95 (6.99)	3.46 (5.83)	7.36 (8.46)
EXPYRS	5.68 (6.92)	2.88 (4.21)	6.59 (7.93)
EXPNUM	10.32 (9.37)	7.61 (7.84)	10.45 (9.82)
RECALL	6.86 (4.22)	8.76 (2.74)	7.31 (4.02)

Percentage of Participants Responding Positively to Each Question on Document #4

Question #4 - Most Recent Involvement	
Review the work to be done	0.3714286
Plan the work to be done	0.2428571
Conduct the Substantive tests	0.3857143
Question #5 - Position in your firm	
Staff Accountant	0.5714286
Senior Accountant	0.1714286
Supervisor	0.0714286
Manager	0.0428571
Partner	0.1428571
Sole Proprietor	0.0142857
Question #6 - Level of Education	
College Graduate	0.8571429
Post Graduate Work	0.1285714
Question #7 - Description of Your Firm	
Local	0.2571429
Regional	0.1000000
National	0.6285714
Other	0.0285714
Question #8 - Have you worked for other CPA firms?	
Yes	0.1571429
Question #9 - Have you worked for other employers?	
Yes	0.4285714
Describe the Employer	
Industry	0.2000000
Governmental/NonProfit	0.0285714
Financial Institution	0.1285714
Service	0.0714286
Question #10 - Are you a CPA?	
Yes	0.3857143
Question #11 - When did you last perform part of an accounts receivable audit task?	
Last Week	0.1142857
Last Month	0.2571429
Six Months ago	0.2000000
One year ago	0.0571429
Two years ago	0
Over two years ago	0.0571429

Question #12 - What type of clients does your firm audit?	
Small Business	0.8285714
Mid-Size	0.7857143
SEC Clients	0.6285714
Governmental	0.9000000
Financial Institutions	0.9285714
Service	0.6714286
Question #13 - Are you actively involved in assessing audit risk?	
Yes	0.4571429
Question #14 - Percentage using Standard Workprograms?	
Yes	0.90000000
Question #15 - Have you heard of articles about:	
Benefits of confirmations	0.2857143
Problems of confirmations	0.4000000

Percentage of Participants Responding Positively to Each Question on Document #4 By Group

	Control	Sch	Tax
Question #4 - Most Recent Involvement			
Review the work to be done	.36	.19	.59
Plan the work to be done	.32	.07	.36
Conduct the Substantive Tests	.41	.46	.27
Question #5 - Position in your firm			
Staff Accountant	.54	.65	.50
Senior Accountant	.18	.23	.09
Supervisor	.04	.03	.13
Manager	.09	.03	.00
Partner	.09	.03	.32
Sole Proprietor	.00	.03	.00
Question #6 - Level of Education			
College Graduate	.91	.84	.82
Post Graduate Work	.09	.16	.18
Question #7 - Description of Your Firm			
Local	.27	.23	.27
Regional	.09	.10	.09
National	.64	.64	.60
Other	.00	.03	.04
Question #8 - Have you worked for other CPA firms?			
Yes	.09	.12	.04
Question #9 - Have you worked for other employers?			
Yes	.41	.31	.41
Describe the Employer			
Industry	.18	.19	.23
Governmental/NonProfit	.00	.04	.04
Financial Institution	.23	.00	.18
Service	.09	.12	.00
Question #10 - Are you a CPA?			
Yes	.41	.34	.41
Question #11 - When did you last perform part of an accounts receivable audit task?			
Last Week	.09	.19	.04
Last Month	.23	.23	.32
Six Months ago	.27	.11	.23
One year ago	.09	.07	.00
Two years ago	.00	.00	.00

Question #12 - What type of clients does your firm audit?			
Small Business	.86	.77	.86
Mid-Size	.82	.73	.81
SEC Clients	.59	.69	.59
Governmental	.95	.84	.91
Financial Institutions	.95	.88	.95
Service	.63	.65	.72
Question #13 - Are you actively involved in assessing audit risk?			
Yes	.45	.42	.50
Question #14 - Percentage using Standard Workprograms?			
Yes	.90	.90	.90
Question #15 - Have you heard of articles about:			
Benefits of Confirmations	.41	.26	.18
Problems of Confirmations	.59	.38	.23

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