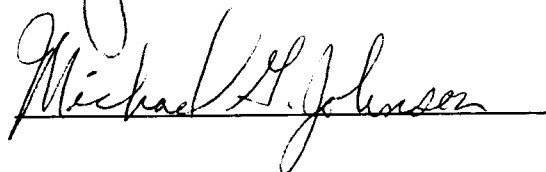
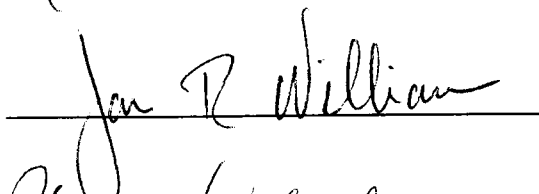


To the Graduate Council:

I am submitting herewith a dissertation written by Tina Y. Mills entitled "The External Auditor's Reliance Decision on the Internal Audit Function: A Test of Cognitive Style and Its Role in the Reliance Decision." I have examined the final copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirement for the degree of Doctor of Philosophy with a major in Business Administration.


James H. Scheiner, Major Professor

We have read this dissertation
and recommend its acceptance:



Accepted for the Council:


Associate Vice Chancellor and
Dean of The Graduate School

**THE EXTERNAL AUDITOR'S RELIANCE DECISION ON THE
INTERNAL AUDIT FUNCTION: A TEST OF COGNITIVE
STYLE AND ITS ROLE IN THE RELIANCE DECISION**

A Dissertation

Presented for the

Doctor of Philosophy

Degree

The University of Tennessee, Knoxville

Tina Y. Mills

May 1993

Copyright © Tina Y. Mills, 1993
All rights reserved

ACKNOWLEDGEMENTS

I would first like to thank the chairman of my committee, Dr. James H. Scheiner, for his support and encouragement throughout this project. I would also like to thank the other committee members, Dr. Michael G. Johnson, Dr. Keith G. Stanga, and Dr. Jan R. Williams, for their guidance on this project and during my tenure in the Ph.D. program. I especially want to thank Dr. Williams for his public accounting contacts that permitted me to gather the data I needed for this project. I also want to thank three of those contacts, Larry Scott from Price Waterhouse and Larry Felts and Rick Schell from KPMG Peat Marwick, for arranging my visits to their offices and scheduling participants for this study.

I owe my sincerest gratitude to Dr. Jon A. Booker, who encouraged me to enter the Ph.D. program and who constantly reminded me over the past several years that I would someday finish it. To Terry Ward and Ben Foster, my colleagues in the program, I say thank you for giving me almost fond memories of the entire experience. Finally, I want to thank my dear friend, Susan Coomer Galbreath, who harassed me often until chapters were written and who was a true friend when I needed one most.

ABSTRACT

Prior research of external auditors' (auditors') reliance on the internal audit function (IAF) provided conflicting evidence on the IAF factors that were important to the auditors' decision and on the degree of consensus among auditors making reliance decisions. These studies contained two major limitations. First, they relied on the auditors' self-reporting the factors that were most important to their decisions, and research has shown that auditors have low self-insight. Therefore, they may not be able to accurately report the most important factors in their decisions. Second, prior research failed to consider that individual differences in the auditors, such as cognitive style, could account for differences in the importance of IAF factors and the degree of consensus among auditors.

The primary objectives of this study were using a more objective data gathering technique to determine the important IAF factors in auditors' reliance decisions and to determine the effect, if any, that auditors' cognitive styles had on their reliance decisions and on the degree of consensus. A secondary objective of this study was to determine if auditors used IAF factors presented in Statement on Auditing Standards No. 65 that was issued to provide guidance to auditors making reliance decisions.

A computer tracing program was developed and used in conjunction with cases to determine the IAF factors that auditors considered in their decision-making process. The program recorded the information that was viewed, the order in which the information was viewed, and the length of time that the auditors spent viewing the information. The program did not require any auditor intervention, and in fact, it

monitored the auditors' decision processes without their knowledge of its existence. Information from this program was compiled and tested for differences between auditors with different cognitive styles.

Cognitive styles were measured using two pen and paper psychological tests, the Group Embedded Figures Test and the Figural Intersections Test. Based on their test scores, auditors were divided into four cognitive style groups. These groups' reliance decisions were tested for differences, and the degree of consensus among the groups was determined.

The results of this study showed that auditors with different cognitive styles made significantly different reliance decisions and that consensus was greater among auditors with similar cognitive styles. Also, this study found that auditors with different cognitive styles used different IAF factors in forming their reliance decisions.

Interestingly, factors used by auditors in this study with one particular cognitive style were consistent with some prior studies, and factors used by auditors with another cognitive style were consistent with other prior studies. These findings suggest that perhaps prior research provided conflicting evidence because the auditors tested in these prior studies had different cognitive styles which were not accounted for in the analysis of their decisions.

This research also found that several IAF factors including factors related to the supervision and evaluation of internal auditors, the independence of the IAF, and top management's support of the IAF mentioned in SAS No. 65 that had not been previously researched were used by auditors in this study. This finding suggests that the Auditing

Standards Board correctly identified factors that are important to an auditor's reliance decision but that had not been identified in prior research.

TABLE OF CONTENTS

CHAPTER 1:

INTRODUCTION	1
Motivation for the Study	2
Contributions of the Research	7
Limitations of the Research	8
Organization of the Research	9

CHAPTER 2:

RELATED RESEARCH	10
Auditing Literature	10
Cognitive Style Theory	22
Accounting and Auditing Studies of Cognitive Style	29

CHAPTER 3:

METHODOLOGY AND HYPOTHESES	32
Design of the Research	32
Development of Hypotheses	35
Development of Experimental Materials	39
Conducting the Experiment	56
Descriptive Statistics	58

CHAPTER 4:

RESULTS	60
Determining Auditors' Cognitive Styles	60

Comparing Reliance Decisions	66
Examining Auditors' Decision Processes	77
Summary	91
Chapter 5:	
CONCLUSIONS AND RECOMMENDATIONS	92
Conclusions	92
Recommendations for Future Research	102
Implications for Accounting Practice	104
BIBLIOGRAPHY	107
APPENDICES	114
Appendix A: Tables	115
Appendix B: Manufacturing Industry Materials	135
Appendix C: Finance Industry Materials	140
Appendix D: Data Base Cards	146
Appendix E: GEFT and FIT Instructions	177
Appendix F: Debriefing Questionnaire	180
Appendix G: Tracing Program	182
VITA	186

LIST OF FIGURES

Figure 1	Criteria that Auditors Consider in Evaluating Internal Auditors	12
Figure 2	IAF Factors Contained in Data Base	43
Figure 3	Tracing Program Script Example	47
Figure 4	Group Embedded Figures Test Example	49
Figure 5	Figural Intersections Test Example	51

LIST OF TABLES

Table 1	Studies of Auditors' Reliance on Internal Auditors	115
Table 2	Current Position of Subjects	117
Table 3	Mean Years of Experience of Subjects by Position	118
Table 4	Highest Degree and Certificates Held	119
Table 5	Gender of Subjects	120
Table 6	Mean Age of Subjects	121
Table 7	Formation of Cognitive Style Groups	122
Table 8	Current Position of Cognitive Style Groups	123
Table 9	Gender, Degree, and Experience of Cognitive Style Groups	124
Table 10	Manufacturing v. Finance Industries	125
Table 11	Mobile v. Fixed Auditors	126
Table 12	Field-Dependent v. Field-Independent Auditors	127
Table 13	Field-Independent-Fixed Auditors v. Others	128
Table 14	Field-Dependent v. Field-Independent Auditors' Use of Factors in Forming Reliance Decision (Order of layer 1 factors)	129
Table 15	Field-Dependent v. Field-Independent Auditors' Use of Factors in Forming Reliance Decision (Viewing time of layer 1 factors)	130
Table 16	Field-Dependent v. Field-Independent Auditors' Use of Factors in Forming Reliance Decision (Order of layer 2 factors)	131
Table 17	Field-Dependent v. Field-Independent Auditors' Use of Factors in Forming Reliance Decision (Most viewed layer 2 factors)	132
Table 18	Field-Dependent v. Field-Independent Auditors' Use of Factors in Forming Reliance Decision (Most viewed layer 3 factors)	133
Table 19	Cognitive Style Effects on Decision Process	134

CHAPTER 1

INTRODUCTION

The internal audit function (IAF)¹ is an important element of an audit client's internal control structure, and therefore, an integral part of an audit conducted in accordance with generally accepted auditing standards. Statement on Auditing Standards (SAS) No. 9, "The Effect of an Internal Audit Function on the Scope of the Independent Audit," (AICPA, 1975) states that in general external auditors (auditors) should consider the IAF's work in determining the nature, timing, and extent of their own auditing procedures and that this consideration should include an evaluation of internal auditors' competence, objectivity, and work performance. In 1991 the Auditing Standards Board (ASB) issued SAS No. 65, "The Auditor's Consideration of the Internal Audit Function in an Audit of Financial Statements," (AICPA, 1991) to expand on the general guidance provided in SAS No. 9. This expanded guidance provides additional examples of IAF factors that auditors should consider when making their evaluation.

Prior research of these SAS No. 9 factors provided conflicting evidence on the relative importance of the factors to the auditor's decision to rely on the IAF's work and on the degree of consensus among auditors making the reliance decision. The explanation previously presented for these conflicting results has been linked to methodological differences (Messier and Schneider, 1988). The main purpose of this research was to

¹ Internal audit function and internal auditor will be used interchangeably throughout this research. Each term refers to the Auditing Standards Board's definition of an internal audit function, which is "...one or more individuals who perform internal auditing activities within an entity." (AICPA, 1991).

establish a relationship between auditors' cognitive processing methods and their reliance decisions and decision processes as a possible explanation for the conflicting evidence in prior studies. A secondary purpose was to provide an initial empirical examination of the additional IAF factors mentioned in SAS No. 65.

Motivation for the Study

After the issuance of SAS No. 9, some auditing researchers studied the importance of various IAF factors to auditors' reliance on internal auditors (Gibbs and Schroeder, 1980; Clark, Gibbs, and Schroeder, 1981; Abdel-khalik, Snowball, and Wragge, 1983; Brown, 1983; Schneider, 1984; Margheim, 1986; Messier and Schneider, 1988; Tiessen and Colson, 1990). The results of these studies were mixed. Some studies reported that the IAF's work performance was the most important factor to auditors (Brown, 1983; Schneider, 1984; Margheim, 1986), while others reported that the IAF's competence or the working relationship between the internal audit function and the auditor was most important (Messier and Schneider, 1988; Tiessen and Colson, 1990).

Some of these researchers also studied the degree of consensus among auditors making the reliance decision (Clark, et al., 1981; Abdel-khalik, et al., 1983; Brown, 1983; Schneider, 1984, 1985) and the degree of self-insight (i.e., the ability to self-report the factors considered most important to the decision) that auditors have when making reliance decisions (Brown, 1983; Tiessen and Colson, 1990). These studies also had mixed results on the degree of consensus, but the researchers agreed that auditors have

low self-insight, and therefore, may be unable to accurately report which factors they used to make the reliance decision.

The explanation offered for the mixed results in these prior studies has been linked to methodological differences (Messier and Schneider, 1988). Another possible explanation is that differences in individual auditors' cognitive processing methods affect the reliance decision. This research studied the effects of differences in auditors' cognitive processing methods on their decision processes and on their decisions to rely on internal auditors' work.

Perhaps as a result of the conflicting evidence in prior studies, internal auditors and others criticized SAS No. 9 for not providing guidance to auditors about using and relying on IAF work (Barrett, 1990). In response to this criticism, the ASB issued SAS No. 65 to provide expanded guidance to auditors making reliance decisions. The new standard did not change the general factors that auditors consider when making reliance decisions (i.e., competence, objectivity, and work performance) but did provide additional examples of IAF factors that have not been considered in prior research. These additional factors were used in this research because the ASB considered them important to the auditor's reliance decision.

As previously discussed, this research sought to establish a relationship between cognitive processing methods and reliance decisions as one possible explanation for conflicting evidence in prior research. The method for storing information in memory and subsequently retrieving it for processing is referred to as cognitive style in the psychology literature. Several accounting researchers (Lusk, 1973, 1979; Chesley, 1977; Benbasat

and Dexter, 1979, 1982; Lusk and Kersnick, 1979) and one auditing researcher (Pincus, 1985, 1990) have studied the effects of cognitive style on accountants' and auditors' decisions, but no published research to date has addressed the issue of how cognitive style affects the decision process.

This research used a case-study approach in a controlled experiment to address the role of cognitive style in the auditor's decision to rely on internal auditors' work. The research was conducted in three phases: 1) auditors' cognitive styles were determined, 2) the reliance decisions of auditors with different cognitive styles were compared, and 3) the decision processes of auditors were examined to determine how information was processed and how cognitive style affected the process. Five offices of two national public accounting firms provided a total of 51 auditors who participated in the study.

Determining Auditors' Cognitive Styles

Accounting researchers who studied cognitive style (Lusk, 1973, 1979; Chesley, 1977; Benbasat and Dexter, 1979, 1982; Lusk and Kersnick, 1979) found that it did not affect the accountants' final decisions. The one auditing researcher who studied cognitive style (Pincus, 1990) found that cognitive style affected auditors' decisions only when it interacted with other personality variables. These researchers focused their research on one particular cognitive style known as field dependence/field independence (FD/FI). FD/FI refers to whether a person perceives objects independently of the context in which they are presented.

However, an important dimension of the field dependence/field independence cognitive style, known as mobility-fixity in the psychology literature, has not been studied

previously by accounting and auditing researchers. Mobility-fixity refers to whether a person always perceives objects independently of context or in entirety (fixity) or whether that person sometimes perceives objects independently and sometimes in their entirety (mobility). Psychologists (Haronian and Sugerman, 1967; Niaz, 1987; Cunningham, Ridley, and Campbell, 1988) have shown that this mobility-fixity dimension is an important element of cognitive style, and therefore, this research examined the mobility-fixity dimension of auditors' cognitive styles.

Comparing Reliance Decisions

After the auditors' cognitive styles were classified, their reliance decisions were compared. Prior accounting and auditing researchers found that FD/FI alone did not affect decision outcomes; therefore, this study tested for a similar result for auditors' reliance decisions. In psychological studies, however, the mobility-fixity dimension of FD/FI did have a significant effect on decisions. Hence, this study asserted that mobility-fixity would also have a significant effect on auditors' reliance decisions. Analysis of variance procedures were used in these comparisons of reliance decisions.

Examining Auditors' Decision Processes

Prior researchers have studied auditors' reliance decisions on internal auditors in an effort to identify the most important factors used in the evaluation. Most of these prior researchers relied on the auditor's self-reporting of the importance of those factors to the reliance decision. However, Tiessen and Colson [1990] found that auditors may not be able to accurately self-report the factors used in making the reliance decisions, and

therefore, used a non-self-report technique (data from internal audit function directors) to gather data on the important factors.

This research extended Tiessen and Colson's [1990] study by choosing a more objective non-self-report technique. Using an interactive data base and a computer tracing program to monitor the auditors' decision-making processes, a report was generated detailing the information that auditors examined in forming the reliance decision. This information was used to examine the decision processes of auditors with different cognitive styles. The factors examined most often by auditors with different cognitive styles were compiled from these reports. These factors were compared to prior research findings in an attempt to explain the mixed results in those studies. Consensus was measured for all auditors and also for auditors with different cognitive styles as a possible explanation for conflicting evidence related to consensus in prior research.

In addition to examining the auditors' decision processes for importance of IAF factors to the reliance decision, this research attempted to establish a relationship between auditors' decision processes and their cognitive styles. This is consistent with Pincus' [1990] call for an examination of **how** cognitive style affects auditor judgment. In her study of the relationship between auditors' cognitive styles and their detection of a material misstatement, Pincus [1990] focused on whether cognitive style affected the final decision but noted that a more important question was how cognitive style affects auditor judgment. T-tests and Chi-Square tests were used to test information from the tracing program reports for differences between the auditors with field-dependent and field-

independent cognitive styles in an attempt to determine the cognitive style effect on the auditors' decision processes.

Contributions of the Research

This research provided valuable contributions to the literature. First, this study provided an initial examination of the mobility-fixity dimension of field dependence/field independence in an auditing setting. This mobility-fixity dimension had a significant impact on auditors' reliance decisions, suggesting that cognitive style is an important determinant of an auditor's reliance decision.

Second, this study used an interactive data base and a tracing program that monitored the auditors' decision processes. This data-gathering technique provided an objective means for exploring the auditor's reliance decision on internal auditors. Because the computer tracing report provided the trail of information assimilated in the decision, less subjectivity on the part of the researcher was required in compiling the information.² This objective tracking of information used in the reliance decision was a major contribution of this study.

A final contribution of this study was the extension of cognitive style research in auditing to the decision process. Pincus [1990] examined the relationship between three

² Most accounting research examining decision processes has relied on the verbal protocol analysis technique for gathering information. This technique requires the researcher to infer the importance of information in the decision process by analyzing subjects' verbal responses during problem solving. Asking subjects to "think aloud" as they perform a task can divert their attention away from the task. Since the report used in this study did not require the auditors' intervention in tracking information used in the decision, their attention was devoted to the problem at hand.

elements of cognitive style (FD/FI, ambiguity tolerance, and category width) and fairness of presentation judgments. The results of her study linked cognitive style to the audit judgment outcome, but she states that how cognitive style relates to auditor judgment is a more important question. This study addressed the issue raised by Pincus and found that cognitive style affects judgment by affecting an auditor's judgment process. In this study the effect on the decision process was that auditors with different cognitive styles used different factors in forming the reliance decision.

Limitations of the Research

Several limitations in the proposed study must be recognized. First, the subjects participating in the study were divided into groups based on their cognitive style test results and, therefore, were not randomly assigned. In addition, only two national accounting firms participated in the study. Because subjects self-select into these firms, no random selection of subjects existed for the study, resulting in internal validity concerns.

Second, the generalizability of the results is limited to the two accounting firms that participated in the study. Also, since this was an exploratory study of the mobility-fixity dimension of FD/FI in auditing, the generalizability of the results to other groups of auditors is limited.

Third, any time an experiment is conducted with hypothetical data, realism and validity are limited. Since the subjects did not make the decision as part of their jobs,

whether they took the assignment seriously is open to question. In addition, since the data provided for the decision were hypothetical, questions arise as to how realistic the task was and whether the decision could be compared with an actual decision made for a real client.

Organization of the Research

Chapter 1 provided a brief introduction to this research and discussed the motivation for the research. Chapter 2 discusses the auditing literature related to this study, the relevant psychology literature related to cognitive style, and accounting literature that has studied cognitive style. The research design and methodology are described in Chapter 3. Chapter 4 presents the results of the data analysis, and Chapter 5 presents this study's conclusions and recommendations for future research.

CHAPTER 2

RELATED RESEARCH

This chapter summarizes relevant auditing, psychology, and accounting literature. In the first section, auditing research concerning the auditor's reliance on the internal audit function is discussed. In the next section, psychology research related to cognitive style and cognitive processing is reviewed, and accounting and auditing research that uses cognitive style theory is reviewed in the last section.

Auditing Literature

Research related to the auditor's decision to rely on the internal audit function can be divided into two broad categories: 1) studies focusing on the reliance decision as part of the auditor's understanding the client's internal control structure, and 2) a study that focuses on the cognitive processes of the auditor making the decision to rely on the internal audit function. Table 1 provides a summary of the studies discussed in this section.³

Internal Control Evaluation

Most of the auditing research concerning SAS No. 9 focused on the auditor's reliance on the internal auditor as part of the internal control structure evaluation.

³ All tables are located in Appendix A.

Reliance in a particular audit area. Ward and Robertson's [1980] survey showed that auditors often relied on the IAF's work as a cost effective way to perform audits. The next step for researchers was to develop lists of criteria used by auditors in evaluating the internal audit function.

SAS No. 9 provided three general factors related to the IAF that auditors should consider: 1) competence, 2) objectivity, and 3) work performance. Competence refers to the internal audit staff's professional qualifications. Objectivity refers to the organizational level to which the internal audit function reports. Evaluation of work performance involves the auditor's review of IAF's working papers for completeness and accuracy. Gibbs and Schroeder [1980] surveyed external and internal auditors to collect criteria used in evaluating the internal audit function. They used a panel of experts and the Delphi Process to separate the criteria into the three categories. The experts rank-ordered the criteria in terms of importance to each of the three categories resulting in 11 criteria identified with competence, 9 with objectivity, and 12 with work performance. Figure 1 presents the criteria developed from Gibbs and Schroeder's [1980] study.

Clark, Gibbs, and Schroeder [1981] conducted three studies in which they examined the process auditors use in evaluating each of the three categories (competence, objectivity, and work performance) separately. Their study of the auditor's evaluation of objectivity used a case-study approach to examine the degree of variability in judgment among auditors. They used the nine criteria for objectivity from the Gibbs and

Competence Criteria

1. Internal audit staff's knowledge of the company's operations, processes, and procedures
2. Educational background of the internal audit staff
3. Internal audit staff's knowledge of new trends and techniques in auditing
4. Existing continuing education program
5. Quantity and quality of supervision within the internal audit department
6. Form, content, and nature of internal audit department's reports
7. Internal audit staff's training and experience in EDP
8. Internal audit department's degree of compliance with professional standards
9. Quality of internal audit department's work papers
10. Existence of documentation in internal audit department's work papers
11. Existence of standards for indexing, cross-referencing, and controlling work papers

Objectivity Criteria

1. Independence of the internal audit department
2. Organizational level to which the internal audit staff reports
3. Ability of the internal audit department to investigate any area of the company's activity
4. Top management's support of the work of the internal auditing department
5. Adequate scope of internal audit department's audits
6. Quantity and quality of supervision within the internal audit department
7. Existence of review procedures within the internal audit department for audits and reports
8. Form, content, and nature of internal audit department's reports
9. Internal audit department's degree of compliance with professional standards

Work Performance Criteria

1. Top management's readiness to act upon the internal audit department's recommendations
2. Top management's support of the work of the internal auditing department
3. Adequate scope of internal audit department's audits

Figure 1

**Criteria that Auditors Consider in
Evaluating Internal Auditors**

4. Quantity and quality of supervision within the internal audit department
5. Acceptance of internal audit staff's findings and recommendations by auditees
6. Form, content, and nature of internal audit department's reports
7. Internal audit staff's knowledge of the company's operations, processes, and procedures

8. Internal audit department's degree of compliance with professional standards
9. Existence of review procedures within the internal audit department for audits and reports
10. Existence and use of audit programs
11. Quality of internal audit department's work papers
12. Existence and quality of documentation in internal audit department's work papers

Figure 1
(continued)

Schroeder [1980] study and developed two levels (satisfactory and unsatisfactory) for the top five criteria.

Cases with combinations of these levels were administered to 25 partners and managers of an international CPA firm. For each case, the subjects scored the IAF's objectivity on a four-point scale from extremely objective to not objective. Using ANOVA to analyze the auditor judgments, Clark, et al. discovered considerable variability or lack of consensus in the way the auditors judged IAF's objectivity. For some auditors, IAF's independence was most important; for others, adequate scope of IAF audits was most important; and for others, neither of these factors was most important. Within each of these three groups, variability existed in how the other four criteria were evaluated.

Since these initial studies, several researchers have studied auditor judgment and evaluated the degree of consensus on reliance decisions. Brown [1983] examined all three factors together rather than as separate dimensions. He used 48 cases of a hypothetical manufacturing company in his survey of seniors and managers from four international accounting firms. The subjects' task was to evaluate each case on the basis of the answers to six questions relating to the competence, objectivity, and work performance of the internal audit function. Each question was phrased so that the answer was either yes or no. The overall reliance decision was determined on a seven-point Likert scale (1=totally unreliable; 7=strong reliability).

Brown's purpose was to determine the factors considered important and whether these factors were used consistently. Internal auditor's independence and prior year's audit work were the two most important factors. He found a high degree of consensus

among the auditors on the reliance decision, and their judgments were stable across 16 repeated cases, indicating the factors were consistently used. Brown also tested for self-insight among the auditors and found it to be low relative to other accounting studies and surprisingly higher among the less experienced auditors, although not significantly higher.

Schneider [1984] attempted to model the auditor's reliance decision by conducting three experiments with 26 auditors. The first operationalized the three SAS No. 9 factors into two items for each factor. The second developed four levels for each of the items. The third used conjoint measurement (because it does not assume interval data like ANOVA does) to develop a model for the auditors' reliance judgments. Most of the auditors followed an additive model in forming the reliance decision (i.e., $\text{Reliance} = a_1\text{Obj} + b_1\text{Comp} + c_1\text{Work}$).

Subjects evaluated 62 profiles of a hypothetical manufacturing company with the various combinations of the internal audit factors. The task was to assess internal audit strength using a 100-point scale. Strength was viewed in terms of the auditors determining the nature, timing, and extent of their work related to the revenue cycle. Work performance was perceived to be the most important factor, followed by competence, and objectivity. The auditors exhibited a high degree of consensus in their evaluation judgments.

In a follow-up study, Schneider [1985] examined the relationship between the IAF's evaluation and the actual reliance on the IAF. Twenty subjects participated in two experiments. The first task was to evaluate the strength of 16 profiles of a hypothetical IAF (from his 1984 study). Subjects ranked the profiles in terms of relative strength.

The second task was to provide reliance judgments for the same 16 profiles. Reliance was measured as a percentage reduction in total audit hours assigned to the revenue cycle.

Consensus was measured in each experiment using Spearman's rho, and the reliance decisions were correlated (using Pearson's product-moment correlation) with the evaluation judgments to determine the consistency between the two judgments. Correlation was very high indicating that the auditors were consistent in assigning fewer (more) audit hours for those profiles they judged stronger (weaker). On average, auditors reduced audit hours by 38% as a result of relying on the IAF; but diversity in the reliance decisions was evident. As the profiles became stronger, the variability in the auditors' reliance measures became greater. When the IAF was weak, auditors agreed that little reliance should be placed on it; but when the IAF was strong, differences in the amount of reliance was evident. Consensus, then, was not as great when the IAF was strong. Competence and work performance were perceived as equally important in the reliance decision, with objectivity less important.

Margheim [1986] examined whether auditors would reduce planned audit hours for tests of controls and substantive tests in the accounts receivable area as a result of reliance on the IAF. Combining competence and work performance into one factor, he manipulated two levels (high/low) of each factor, resulting in four cases. A control case was also developed that did not mention an internal audit function. Five groups of auditors from international accounting firms were mailed the case materials. Four groups received the experimental cases, and the fifth group received the control case.

The subjects' task was to budget audit hours for four tests of controls and five substantive tests. They were given the prior year's actual hours for each test. MANOVA tests indicated significant differences between the hours budgeted for the control case and the two cases with high competence/work performance, but no significant differences existed between the control case and the two cases with low competence/work performance regardless of the level of objectivity. ANOVA tests showed that competence/work performance significantly affected the hours assigned for tests of control and substantive tests, but the objectivity factor and the interaction between objectivity and competence/work performance were not significant.

Abdel-khalik, Snowball, and Wragge [1983] conducted two experiments with seniors and managers to test the effect of three EDP audit techniques and two objectivity variables on auditors' planning judgments. The planning judgments were: 1) reliance on the internal auditor (number of hours assigned to internal audit), 2) hours planned for compliance testing, and 3) hours planned for substantive testing. Accounts receivable and accounts payable systems were used as the experimental setting.

Using ANOVA and MANOVA, the authors found that the level to which the IAF reports is the most important factor in the auditor's reliance decision, and the EDP audit techniques used were of equal importance in the decision. Subjects were consistent over time in their decision, but they exhibited little consensus on the reliance decisions except for agreement on the importance of the level to which the internal audit staff reports.

Overall reliance on internal audit. The research discussed above studied the reliance decision in a particular area (e.g., accounts receivable or the revenue cycle).

More recent studies on auditor reliance have examined the overall IAF reliance decision. Messier and Schneider [1988] used the Analytic Hierarchy Process (AHP) to develop a hierarchy of attributes that auditors use in evaluating internal auditor strength. AHP combines direct comparisons of attributes to determine their overall importance. The hierarchy contained three levels of attributes, each becoming more detailed. The first level contained the three factors mentioned in SAS No. 9, competence, objectivity, and work performance. Level 2 contained 11 attributes related to the first level factors, and level 3 contained 26 detailed items related to the second level factors. An experiment was conducted that asked 22 supervisors and managers from international accounting firms to make pairwise comparisons of each level of factors. The authors used Schneider's [1984, 1985] case, which involved a hypothetical manufacturing company.

The results of the experiment showed that competence was the most important attribute in the reliance decision, objectivity was second, and work performance was third. Internal audit experience was the highest ranked attribute related to the competence factor, and auditing experience was the most important experience-related item. Internal audit independence was the most important attribute of objectivity, and specifically, freedom from conflicting duties was the highest ranked item related to independence. Finally, scope of internal audits was the most important attribute in the work factor. Number of items examined ranked highest in importance relative to the scope attribute.

The authors found considerable variability in the subjects' weightings of the factors at each of the three levels. Individuals were also inconsistent in their level 2 pairwise comparisons, especially with respect to the competence criterion. The authors

suggest that perhaps the qualitative nature of the attributes led to the high variability among auditors. Also, the overlap in meaning among the SAS No. 9 factors may cause some variability. The authors offered no explanation for the inconsistency in individual comparisons.

This study's finding that competence was the most important factor in evaluating the IAF contradicts previous studies that found work performance to be the most important factor (Brown, 1983; Schneider, 1984, 1985) or a combined competence/work performance factor (Margheim, 1986). The authors suggested that one reason for the different results may have been the methodology used. As mentioned above, the AHP combines direct comparisons of attributes to determine their overall importance. Regression analysis and conjoint measurement take the overall reliance decision and infer the importance of specific attributes. Another explanation offered for the differences between this study and previous research was that this study explicitly recognized the interrelationships among the attributes by placing them in a hierarchical structure.

Byington and Munter [1989] also studied the overall reliance decision by surveying CPA firm partners and managers who have clients with IAFs. Only 13 partners and managers participated in this survey. Two constructs for each SAS No. 9 factor, each measured at four levels, were extracted from Schneider's [1984] work. The resulting 64 combinations of the three factors were given to the participants. They were asked to evaluate each of the 64 profiles and indicate on a 100-point scale the extent of reliance they would place on the internal audit function in each profile.

The participant's average reliance scores were presented as a measurement tool for use by the auditor and their clients. For example, an auditor can assess where a particular client is in terms of the levels of each construct and use the average reliance score from this study as an expected reliance on the internal auditor in the planned audit program. The client can measure the constructs at any time and determine what the expected degree of reliance will be. If some constructs need improvements in order to increase the degree of reliance, the organization can evaluate the costs of making the improvement.

Cognitive Processes

Tiessen and Colson [1990] conducted a study to determine whether auditors can accurately self-report the variables they consider in making reliance decisions on the IAF and to determine if the variables influencing the reliance decision are affected by the client's industry. The authors were motivated to conduct this study by two factors. One factor is that prior research in this area relied on surveys and experiments (both of which are self-report techniques) to determine which factors were important in the reliance decision. The second factor motivating the study is that prior research was narrowly focused because only the manufacturing industry has been used in the research cases.

Nisbett and Wilson [1977] suggest that individuals cannot access their higher-order cognitive processes and, therefore, are unaware of all factors that are used in making a particular decision. Since prior research relied on self-report to examine the factors considered in the internal audit reliance decision, Tiessen and Colson conducted a study that did not rely solely on self-report.

In this study, the auditors evaluated actual clients' IAFs rather than hypothetical clients. Data was also collected from internal audit directors in each of the companies participating in the study. Internal audit directors from 254 companies and their auditors completed two questionnaires related to the auditor's reliance decision.

The study was conducted in two phases: 1) a self-reporting phase, and 2) a structured field study. In the self-reporting phase, the auditors were given 12 criteria taken from the work of Gibbs and Schroeder [1980] and Brown [1983] and asked to indicate on a five-point scale the extent to which each criterion influenced their reliance judgment. They were also asked for the overall degree of reliance placed on the client's IAF. In the structured field study, the authors collected data directly from the internal audit directors on the competence, objectivity, and work performance of the IAFs.

The 12 criteria were related to the auditor's overall reliance decision to determine if the auditors in this study would report the same criteria associated with the reliance decision as had been reported in previous research. This study supported findings of previous research. Variables related to work performance were reported as being most important to the decision.

The data collected from the internal audit directors was also compared to the auditors' overall reliance evaluation using stepwise regression. The results were considerably different from prior research and from the auditors' self-reports. The results showed that the working relationship between the auditor and the internal auditor was the most important factor in the reliance decision. If the auditor influenced the internal audit program, the degree of reliance was higher than if the two auditors worked independently.

Also, the degree of reliance was negatively affected by the internal auditor's performance of quality control investigations (an operational auditing activity). The only objectivity variable that was significantly associated with reliance was the audit committee's consultation with the internal audit director regarding the auditors' work. No competence variables significantly affected the reliance decision.

ANOVA results showed that reliance decisions differed significantly across the nine industries included in the study. Stepwise regression was used to get a more detailed look at the manufacturing and finance/insurance industries. The variables collected from the internal audit directors explained 48% of the variance in the manufacturing industry but only 18% in the finance/insurance industry; and the significant variables were different for the two industries, suggesting that future research should consider client industry as a variable affecting the auditor's reliance decision on the IAF.

Cognitive Style Theory

The literature reviewed in this section includes psychological studies focusing on field independence and the mobility-fixity dimension of FD/FI. The final section discusses accounting and auditing studies that have used the FD/FI cognitive style.

Field Dependence/Field Independence

Cognitive style refers to the way in which people organize and process information [Goldstein and Blackman, 1978]. The cognitive style literature in psychology includes a research area that centers on one particular cognitive style known as field

dependence/field independence. Field independence generally implies the ability to use internal referents in perception and information processing [Witkin and Goodenough, 1977]. Field-independent (FI) subjects are expected to be better at cognitive restructuring tasks because they have the ability to perceive an object independently of the context in which it is presented. Field-dependent (FD) subjects are dominated by the organization of the field and are not as capable as field-independent subjects in overcoming embedding contexts. They rely on external sources and use ambiguous data in making decisions or solving problems [Witkin and Goodenough, 1977; Goodenough, 1976; Gul and Zaid, 1981] They are described as being more comfortable in interpersonal domains than in analytical ones.

Three instruments have been used to test for field independence. The body adjustment test involves placing a person in a tilted room and asking that person to adjust his or her body to the upright position while the room remains tilted. Field-independent subjects can usually align their bodies correctly in the upright position, whereas field-dependent subjects tend to align their bodies with the tilted room. The rod-and-frame test is similar to the body adjustment test except that the subject's task is to bring a tilted rod to the upright position against a tilted frame. Field-dependent subjects perform the same way in the rod-and-frame test as they do in the body adjustment test in that they rely on the frame as a reference point for aligning the rod. Field-independent subjects use internal referents for making the adjustment. Finally, the Group Embedded Figures Test (GEFT) [Oltman, Raskin, and Witkin; 1971] is a written perceptual test of field independence that can be easily administered to multiple subjects at one time.

Witkin [1950] first described the cognitive style of field dependence/field independence in a study where he administered the Embedded Figures Test⁴ to a group of college students. In the Embedded Figures Test (and the Group Embedded Figures Test), the subject's task is to locate a simple geometric figure in a larger complex figure. Subjects who perceive a figure independently of the context in which it is presented are considered field independent. Subjects who find it difficult to perceive objects independently of their surroundings are said to exhibit a field-dependent cognitive style.

Cooperman [1980] suggested that cognitive style is simply a measure of general intelligence. In his study of college students, subjects were divided into FD and FI groups based on their GEFT scores and given rote learning and verbal reasoning tasks. Field-independent subjects scored significantly higher than field-dependent subjects on both the rote learning and the verbal reasoning tasks, suggesting that cognitive style, or at least the tests of cognitive style, is a measure of general intelligence.

Witkin [1977] argued that the GEFT is not a measure of general intelligence in his longitudinal study of a group of students from college entry to graduate school. He found that FI students tend to favor impersonal domains requiring cognitive restructuring skills (e.g., sciences), whereas FD students prefer interpersonal domains (e.g., elementary education). If students' choices were incongruent with their cognitive style, they tended to shift to a more compatible domain by graduation or graduate school.

Witkin's study suggested that cognitive style is not a measure of general intelligence because GEFT and SAT-Verbal scores were not correlated, but GEFT and

⁴ The Embedded Figures Test (EFT) is similar to the GEFT except that the EFT must be administered individually whereas the GEFT can be given to several subjects at once.

SAT-Math scores were highly correlated. Also, little correlation existed between GEFT scores and GPA, but SAT scores are highly correlated with GPA, so Witkin concluded that the GEFT measures some cognitive factors other than general intelligence.

In fact, Witkin, Moore, Goodenough, and Cox [1977] argue that differences in cognitive style reflect differences in process rather than ability. If style and intelligence are closely related, one could argue that individuals with different cognitive styles have different abilities in solving problems or processing information. But a difference in process means that individuals with the same cognitive style (either field dependent or field independent) will consistently choose the same approach or strategy to solve a problem. Field-independent individuals tend to use analytic strategies, and field-dependent individuals use global strategies. Other studies have supported Witkin's contention that different cognitive styles reflect different processes rather than different abilities (O'Connor and Blowers, 1980; Clark and Roof, 1988).

Because the GEFT was normed with students at a liberal arts college⁵, several studies have examined the performance of different groups on the GEFT and compared those groups' norms with the original norms for the test. Groups that have been given the GEFT include practicing accountants (Pincus, 1985, 1990), undergraduate business students in Canada (McRae and Young, 1988), business students in American universities (DeSanctis and Dunikoski, 1983; Lusk and Wright, 1981), and finance specialists (Mykytyn, 1989).

⁵ Reliability and validity data for the GEFT are discussed in Chapter 3.

In each study, the authors reported that accountants and business students were more field independent than the norms established with liberal arts students. These studies also examined the existence of sex differences in GEFT scores because the original norms and other recent studies using liberal arts students (Hulfish, 1978; Carter and Loo, 1980) reported that men were significantly more field independent than women. The studies using business students (McRae and Young, 1988; Desanctis and Dunikoski, 1983; Lusk and Wright, 1981), finance specialists (Mykytyn, 1989), and accountants (Pincus, 1985) reported that no significant differences existed between the men and women in their studies.

Lusk and Wright [1981] suggested that the reason sex differences did not appear in groups using business students was because the education provided in the business curriculum minimized the differences between men and women. They showed that when curriculum was taken into account, no significant sex differences existed, but when the curriculum effect was ignored, there were significant sex differences. Pincus [1985] made a similar argument for the lack of sex differences in practicing accountants and business students. She also argued that perhaps men and women attracted to business and accounting are a more homogeneous group than those attracted to liberal arts, but no statistical support for the argument was provided.

Mobility-Fixity Dimension

Werner [1957] first discussed mobility and fixity from a developmental perspective as being polar principles of development. Fixity can imply ultimate stability in operation, even to the point of automaticity. Werner argued, however, that as individuals mature,

they can operate in a more mobile fashion, meaning that they can function as either field dependent or field independent.

Witkin [1965] brought the mobility-fixity dimension to the problem solving literature and argued that the mobility quality could not be found in field-dependent subjects. He said that only field-independent subjects can vary on the mobility-fixity dimension. Hansson, Ryden and Johnsson [1986] also concluded that field independence was associated with mobility and field dependence with fixity.

Haronian and Sugerman [1967] and Bloomberg [1971], however, presented evidence that field dependence could be associated with both mobility and fixity. Because their studies used subjects who were about 19 years old, Eisner [1972] conducted a study to see if the relationship between mobility-fixity and field independence varied with age. He studied five groups of subjects ranging in age from 10 to 83 years old. The results showed that mobility-fixity did not vary more (less) with the more field-independent (dependent) subjects, suggesting that field dependence can be associated with varying degrees of mobility. In other words, all four subtypes of field dependence/field independence are possible according to Eisner (FI-fixed, FI-mobile, FD-fixed, FD-mobile).

Field-independent/dependent subjects who are fixed are expected to always operate in a field-independent/dependent fashion. Field-independent/dependent subjects who are mobile have both field-independent and field-dependent characteristics and have the ability to vary their problem-solving strategies according to the circumstances of the problem at hand. Cunningham, Ridley, and Campbell [1988] hypothesized that FI-fixed subjects would outperform other subtypes (FI-mobile, FD-fixed, FD-mobile) on a complex

cognitive task. The reasoning for this hypothesis stems from Haronian and Sugerman's [1967] work suggesting that because FI-mobile subjects possess such a broad range of possible responses to a problem, they can become confused and indecisive on complex cognitive tasks.

In the Cunningham et al. study, the subjects' scores on the GEFT determined their FD/FI status, and the Breskin-Rigidity Test was used to assess mobility-fixity. Using the median-split technique⁶, four groups were formed, FD-mobile, FI-mobile, FD-fixed, FI-fixed. The subjects completed Gorham's Proverbs Test, a complex cognitive task. As expected, FI subjects scored higher than FD subjects on the test and FI-fixed subjects outperformed FD-mobile and FD-fixed subjects but not FI-mobile subjects on one version of the test; and on the other version of the test, the FI-fixed subjects did not score significantly higher than either the FI-mobile or the FD-mobile subjects.

Niaz [1987] assessed mobility-fixity using the Figural Intersections Test (FIT) and the Group Embedded Figures Test. The FIT is a pen-and-paper psychological test designed to measure M-space, which is the "...maximum number of figurative or operational schemes that a person's short-term memory may hold at one time" [McCormick, 1982]. In the FIT, two sets of geometric figures are presented to the subject. One set, called the presentation set, presents the figures discretely. The other set, called the test set, presents the figures in an overlapping way such that only one area of common intersection exists. The subject's task in the FIT is to find the area of

⁶ The median-split technique involves placing subjects who score the median and above the median in one group and those scoring below the median in another group. Then each of these groups can be further subdivided using other test scores and the same division technique. This technique was used in this research.

common intersection and mark it with a dot. The GEFT, as discussed earlier, requires the subject to locate a geometric figure within a more complex figure.

Niaz and Lawson [1985] reported a significant correlation (.38) between the FIT and the GEFT, suggesting that both are measures of field independence. Niaz [1987] argued that when combined, however, the two tests would measure mobility-fixity in addition to field dependence/field independence. Subjects who scored high or low on both tests could be labeled "fixed" since they operated consistently in a field-independent or field-dependent manner. Conversely, subjects who scored high on one test but low on the other could be labeled "mobile" since they exhibited elements of both cognitive styles.

Niaz's study of 99 college students showed that field-independent fixed subjects performed better than mobile subjects on formal analytical tasks (those tasks requiring proportional and probabilistic reasoning) and that mobile subjects performed better than fixed subjects on variables that require the ability to separate out critical pieces of information for problem solving (such as chemistry, math, and biology courses).⁷

Accounting and Auditing Studies of Cognitive Style

Most of the accounting and business research that has studied cognitive style has examined the importance of the decision maker's cognitive style in designing information systems (Lusk, 1973, 1979; Chesley, 1977; Benbasat and Dexter, 1979, 1982; Lusk and

⁷He operationalized the analytical cognitive variables using the Raven's Progressive Matrices Test and the Lawson Classroom Test of Formal Reasoning; the variable for hypothesis 2 was operationalized using the subjects performance in freshman level chemistry, mathematics, and biology courses.

Kersnick, 1979). The argument is that a better knowledge of individual user characteristics influencing decision making will lead to more effective information systems. Some of these studies have shown that groups with different cognitive styles preferred different reports from their information systems but that performance in decision-making tasks did not differ between groups (Lusk, 1973, 1979; Benbasat and Dexter, 1979; Lusk and Kersnick, 1979).

Other studies have focused on the effect of the cognitive style variable and its interaction with personality variables on accountants' and bankers' confidence in their decisions (Gul, 1983, 1984, 1986). These studies have found that FD/FI did interact with tolerance for ambiguity, a personality variable, and affected accountants' and bankers' confidence in their decisions. Pincus [1990] studied the effect of field dependence/field independence and two other individual difference variables (category width and ambiguity tolerance) on auditors' detection of a material misstatement. She found that FD/FI and ambiguity tolerance were significantly related to an auditor's ability to detect a material misstatement, with field dependence/field independence being the most important.

In each of these studies, cognitive style is regarded as an important variable in the analysis of decision making. Since individual accountants, bankers, or financial analysts can differ in the way they organize and process information, the literature has recognized that the cognitive style factor must be considered in any decision process research.

Previous accounting research that has considered cognitive style, however, has considered only the field dependence/field independence portion of the cognitive style literature. This researcher is not aware of any published accounting work that considers

the effect of the mobility-fixity dimension on accountants' decision making. Since some psychological studies (Haronian and Sugerman, 1967; Bloomberg, 1971; Eisner, 1972) have shown that the mobility-fixity dimension is important to understanding field dependence/field independence, this study will examine the effects of both FD/FI and mobility-fixity on auditors' decisions.

The next chapter describes the design of this research and the methodology employed in analyzing this study's data.

CHAPTER 3

METHODOLOGY AND HYPOTHESES

Data for this study was collected using an experiment with auditors. The following sections describe the design of the research, the development of the research hypotheses, the development of the materials used in the experiment, the conducting of the experiment, and descriptive statistics related to the research subjects.

Design of the Research

The purpose of this research was to examine the role of cognitive style in an auditor's decision to rely on the IAF's work. Cognitive style effects were expected to serve as a possible explanation for mixed results in prior studies related to importance of IAF factors and consensus among auditors. To accomplish this purpose, the study was conducted in three phases: 1) determining auditors' cognitive styles, 2) comparing the reliance decisions of auditors with different cognitive styles, and 3) examining the process auditors used to evaluate information in making the reliance decision.

Determining Auditors' Cognitive Styles

The first phase of this research involved determining the cognitive styles of the auditors participating in the study. Messier and Schneider's [1988] finding that competence was the most important factor in evaluating internal audit functions

contradicted previous studies that found work performance to be the most important factor (Brown, 1983; Schneider, 1984, 1984; Margheim, 1986). The authors attributed the difference to the methodologies used in the studies. The effect of cognitive style was not considered in any study of auditors' reliance on internal audit. Since accounting and auditing studies that have considered cognitive style (Lusk, 1973, 1979; Chesley, 1977; Benbasat and Dexter, 1979, 1982; Lusk and Kersnick, 1979; Gul, 1983, 1984, 1986; Pincus, 1990) found it to be an important factor in an analysis of decision making, this study examined the effects of cognitive style on the auditor's reliance decision on internal auditors. Two pen-and-paper psychological tests were used to measure each auditor's cognitive style. The auditors' scores on these tests were used to categorize them into one of four cognitive style groups.

Comparing Reliance Decisions

The second phase of this study compared the reliance decisions of auditors with different cognitive styles. As previously mentioned, accounting studies of cognitive style show that FD/FI alone does not affect decision outcome but does affect preference for information (Lusk, 1973, 1979; Benbasat and Dexter, 1979; Lusk and Kersnick, 1979). Although no previous accounting study has considered the mobility-fixity dimension of FD/FI, some psychological studies (Niaz, 1987; Cunningham, et al., 1988) have shown that mobility-fixity affects decision making. Therefore, this study compared the decisions of mobile and fixed auditors and of field-dependent and field-independent auditors.

Examining Auditors' Decision Processes

The final phase of this research examined auditors' decision processes to determine how they make the reliance decision and how their cognitive styles affect that decision. Pincus [1990] noted that although a study of the audit judgment outcome was interesting, "...a more intriguing process question remains to be answered: How do individual differences affect audit judgment?" [p. 160]. This study attempts to explain how one individual difference, cognitive style, affects the audit judgment of reliance on internal audit.

A computer program was developed to trace the auditor's information search through a data base of information related to the IAF. This program generated a report detailing each piece of information the auditor viewed, how long the information was viewed, and the order in which the information was retrieved. The program generated this tracing information "behind the scenes," so that the auditors were not aware that their decision process was being studied as well as their decision outcome. These reports were then divided into four groups corresponding to the four cognitive style groups. The information was summarized according to the pieces of data viewed, time spent viewing the data, and the order in which the data was viewed and was analyzed for differences among the four groups. In addition, consensus was measured for each of the four cognitive style groups as well as for individual auditors to determine if those auditors with similar cognitive styles had higher degrees of consensus.

Development of Hypotheses

The following sections describe the hypotheses related to the three phases of the research.

Determining Auditors' Cognitive Styles

Pincus [1985] found that practicing accountants are more field independent than liberal arts students used to norm the GEFT. Studies using business students reached similar conclusions (McRae and Young, 1988; DeSanctis and Dunikoski, 1983; Lusk and Wright, 1981). Other studies have shown, however, that accountants and business students vary in the degree of field independence (Lusk, 1973, 1979; Lusk and Kersnick, 1979; Cunningham, et al., 1988). Accordingly, the researcher divided auditors in this study into two groups, field dependent and field independent, using their GEFT scores. Use of the GEFT to measure cognitive style is consistent with prior research studies using accountants and business students. The GEFT will be described in more detail later in this chapter.

As presented in Chapter 2, Niaz [1987] and Cunningham et al. [1988] found that the mobility-fixity dimension of field dependence/field independence is an important factor in understanding cognitive style and, therefore, should be used in conjunction with FD/FI in studies exploring the decision-making process. Although studies in the accounting literature have examined cognitive style, they have not considered the mobility-fixity dimension of field dependence/field independence. Therefore, this research provided initial evidence relating the effect of mobility-fixity on auditors' decisions.

Mobility was measured using the Figural Intersections Test and the GEFT scores. The FIT will be discussed in more detail in the experimental materials section. Using the auditors' FIT and GEFT scores, the researcher further divided the field-dependent and field-independent auditors into mobile and fixed groups. These two divisions resulted in four groups for analysis in the study, FI-fixed, FI-mobile, FD-fixed, and FD-mobile. Whether auditors as a group are field independent or field dependent was not critical to this research. The more important issue was how FI/FD and mobility-fixity affected the decision to rely on internal auditors; therefore, no formal hypotheses related to the forming of the groups were tested.

Comparing Reliance Decisions

According to Niaz [1987], mobile subjects perform better than fixed subjects on tasks that require separating out critical pieces of information for problem solving, but fixed subjects perform better on formal analytical tasks. One could argue that audit tasks typically require the auditor to separate out critical pieces of information. For example, in detecting misstatements in the client's financial statements, the auditor must disembed the mistake from the entire set of financial information. Mobile auditors, then, should perform better than fixed auditors on most audit tasks.

The definition of *better* depends on the audit task. For some audit tasks, such as fraud detection, defining better is rather clear. The auditor who successfully detects fraud performs better than an auditor who does not detect it. In a reliance on internal audit task, however, the definition is not so clear. A better decision would be one in which the

auditor placed the optimal amount of reliance on the internal auditor (i.e., neither too little reliance nor too much reliance).

Determining this optimal amount, however, is difficult. Therefore, this researcher had no a priori expectations about the *direction* in which the decisions of mobile and fixed auditors would be different but did expect a significant difference between the decisions. As discussed above, accounting researchers have shown that the degree of field independence does not affect decision outcome⁸. Therefore, the first two hypotheses (all hypotheses are stated in the alternative form) are:

Hypothesis 1: Mobile and fixed subjects will make significantly different reliance decisions.

Hypothesis 2: FD and FI subjects will not make significantly different reliance decisions.

A one-way analysis of variance (ANOVA) was used to test Hypotheses 1 and 2.

Cunningham, et al. [1988] hypothesized that of the four cognitive style subtypes, FI-fixed subjects should perform better than others on complex cognitive tasks. As discussed in Chapter 2, Haronian and Sugerman [1967] and Cunningham et al. [1988] proposed that FI-mobile subjects can become confused on complex cognitive tasks because they may have many solutions to a problem. This reasoning further suggests that FI-fixed subjects will not experience the same confusion, and, therefore, will perform better because their number of possible solutions is smaller. Since defining *better* is difficult for an auditor's reliance judgment on internal audit, this hypothesis is also stated generally:

⁸ Pincus [1990] found a significant difference between field-dependent and field-independent auditors but only when FD/FI interacted with ambiguity tolerance.

Hypothesis 3: Field-independent fixed auditors will make significantly different reliance decisions from other cognitive style subtypes (FI-mobile, FD-fixed, and FD-mobile).

Hypothesis 3 was also tested using ANOVA.

Examining Auditors' Decision Processes

Accounting researchers (Lusk, 1973, 1979; Benbasat and Dexter, 1979; Lusk and Kersnick, 1979) have shown that the degree of field independence affects preference for information. Therefore, this study tested for the cognitive style effect on preference for information in an auditing context.

Hypothesis 4: Field-dependent and field-independent auditors will use different factors in forming the reliance decision.

In each of the previous accounting studies of cognitive style (Lusk, 1973, 1979; Benbasat and Dexter, 1979; Lusk and Kersnick, 1979), the choice for information was either dichotomous or categorical⁹. This study placed no constraints on the subjects' information choice within the data base provided. As discussed in the previous section, reports on the factors used in the decision were generated by a software program used in conjunction with the data base developed for this study. This program, described in more detail in the data base development section, produced a report for each user that listed the information used, the order in which the information was used, and the length of time spent with the information. The reports of the field-dependent subjects and the reports of the field-independent subjects were compiled for analysis. The factors used by each

⁹ Lusk [1973] and Benbasat and Dexter [1979] used a dichotomous variable (High/Low analytic reports and structured/unstructured information search method, respectively) for information preference. In Lusk [1979] and Lusk and Kersnick [1979], subjects could choose among five categories of reports (two tabular and three graphic) for information.

group were summarized into various information choice categories depending on the order searched, item used, and time spent with the information. These categories were tested for differences between field-dependent and field-independent auditors using t-tests and chi-square and Fisher's Exact tests for independence.

Consensus was measured by correlating all pairs of auditors' reliance decisions, which is consistent with prior research that measured consensus (Brown, 1983; Schneider, 1984, 1985), and the reliance decisions of auditors within each cognitive style group to determine if consensus varied depending on auditors' cognitive styles.

Development of Experimental Materials

This study examined decisions made by auditors from two Big Six accounting firms. The auditors used data provided by a case and a data base of information for making their decisions. The following sections discuss case development, data base development, tracing program development, psychological tests used, subjects and their task, and the pilot study.

Case Development

The case used in this study contained general information about a hypothetical client's IAF. Two different industry cases were developed, one for a manufacturing client and one for a financial client. Tiessen and Colson [1990] tested for industry differences in their study and found that the factors influencing reliance on internal audit differed significantly across nine industries. Since 33 percent and 38 percent of their cases were

from the manufacturing and finance/insurance industries, respectively, these two industries were chosen for use in this study. Appendix B contains the manufacturing industry materials used in this study. Appendix C contains the finance industry materials used.

In each case, the IAF employed 25 personnel. A relatively large number was chosen so that the auditors would not simply disregard the department because of size and would consider IAF qualifications before making a reliance decision. The company represented in the case was also portrayed as financially stable and competitive to encourage the auditors to consider the internal auditors' abilities and not ignore them because of environmental factors.¹⁰ Detailed information about the internal auditors' competence, objectivity, and work performance was provided in a computerized data base described in the next section.

Data Base Development

The data base developed for this study followed Messier and Schneider's [1988] hierarchical approach to organizing the data into three layers, and each layer contained several items of information. The first layer contained the three general factors related to internal auditors that are mentioned in SAS Nos. 9 and 65: 1) competence, 2) objectivity, and 3) work performance. The second layer of the data base contained three or four subsections of information related to each of the three general categories. Finally, the third layer contained detailed items of information about the internal auditors within each of the subsections. In this data base, the factors were not only listed, but levels of

¹⁰ Schneider [1984] used a large, financially strong manufacturing company in his study to achieve the same results.

these factors were provided so that the auditors could evaluate the effectiveness of the IA function in the case and then make the reliance decision.

Before the data base was developed, the researcher conducted two-hour interviews with four senior managers of a Big Six CPA firm. These senior managers had extensive experience making reliance decisions on the IAFs of large audit clients. The information obtained from the interviews was used to construct the data base materials so that the factor levels were realistic. Many factors used in this study's data base were taken from prior research¹¹. In addition, some factors mentioned in the exposure draft of SAS No. 65 that had not been previously mentioned in prior research were added to make the data base as complete and realistic as possible. The senior managers indicated that their firm did not have additional procedures for evaluating IAFs besides those recommended in SAS No. 9. Therefore, the factors contained in this data base were considered adequate for their evaluation process. Figure 2 lists the factors contained in the data base, the sources of those factors, and the justification for including the factors in the data base.

The data base was constructed on a Macintosh computer using HyperCard. The data base was constructed so that the auditors could view any piece of information at any time from any point. This meant that they did not have to view the information in any particular order and could review items of information as often as they desired. In addition to its flexibility, the data base was self-contained and self-explanatory. That is, the data base contained on-line instructions for use and once inside the system, the auditors needed no computer expertise to operate the program. To navigate within the

¹¹ Gibbs and Schroeder [1980], Brown [1983], Schneider [1984], and Messier and Schneider [1988] provided most of the factors used in this study.

<i>Factor</i>	<i>Source</i>	<i>Justification</i>
Competence:		
1) Internal audit (IA) staff's knowledge of company operations, processes, & procedures	Gibbs & Schroeder [1980], Brown [1983]	Used in prior research
2) Educational background of IA staff	Gibbs & Schroeder, Messier & Schneider [1988]	Used in prior research
3) Certification of IA staff	Brown, Messier & Schneider	Used in prior research
4) Existence of continuing education program	Gibbs & Schroeder, Brown, Messier & Schneider	Used in prior research
5) Existence of in-house training programs	Brown, Messier & Schneider	Used in prior research
6) Internal audit function's (IAF) degree of compliance with professional standards	Gibbs & Schroeder	Used in prior research
7) IA staff's experience in EDP auditing	Gibbs & Schroeder	Used in prior research
8) IA staff's auditing experience	Messier & Schneider	Used in prior research
9) IA staff's experience with company	Messier & Schneider	Used in prior research
10) Quantity & quality of instruction & supervision within IAF	Gibbs & Schroeder, Brown, Schneider [1984]	Used in prior research
11) Existence of standards for indexing & cross-referencing work papers	Gibbs & Schroeder	Used in prior research
12) Existence of documentation in IAF's work papers	Gibbs & Schroeder	Used in prior research
13) Assignment of internal auditors to IAF audits	SAS No. 65	Previously not researched but ASB considered important
14) Review of IA staff's and manager's performance	SAS No. 65	Previously not researched but ASB considered important
Objectivity:		
1) Organizational level to which IAF reports findings	Gibbs & Schroeder, Brown, Schneider, Messier & Schneider	Used in prior research
2) Organizational level to which IAF reports administratively	Messier & Schneider	Used in prior research
3) IA director's access to audit committee	Brown, Messier & Schneider	Used in prior research
4) Freedom from conflicting duties	Schneider, Messier & Schneider	Used in prior research

5) IAF's authority to investigate any area of company's operations	Gibbs & Schroeder, Messier & Schneider	Used in prior research
6) Existence of policies prohibiting internal auditors from auditing areas where relatives are employed in audit-sensitive positions	SAS No. 65	Previously not researched but ASB considered important
7) IA director's access to CEO and Board of Directors	SAS No. 65	Previously not researched but ASB considered important
8) IA director's control over employment decisions related to IAF	SAS No. 65	Previously not researched but ASB considered important
9) Existence of formal follow-up procedures for implementation of IAF recommendations	Brown, Messier & Schneider	Used in prior research
Work Performance:		
1) Adequate number of items examined in internal audits	Gibbs & Schroeder, Schneider, Messier & Schneider	Used in prior research
2) Adequate number of hours assigned to each audit	Gibbs & Schroeder, Schneider, Messier & Schneider	Used in prior research
3) Review of work papers and audit reports	Gibbs & Schroeder, Brown, Messier & Schneider	Used in prior research
4) Responsibility for development of audit programs	Gibbs & Schroeder, Messier & Schneider	Used in prior research
5) Adequate coverage of audited area in audit programs	SAS No. 65	Previously not researched but ASB considered important
6) Work performed in accordance with the audit program	Gibbs & Schroeder, Schneider, Messier & Schneider	Used in prior research
7) Reports are consistent with work papers	Gibbs & Schroeder, Messier & Schneider	Used in prior research
8) Conclusions in reports consistent with evidence collected	SAS No. 65	Previously not researched but ASB considered important

Figure 2

IAF Factors Contained in Data Base

system, the auditors only had to click on appropriate buttons using a mouse. Appendix D contains all the cards included in the data base.

Tracing Program Development

Tiessen and Colson [1990] criticized previous research on the auditor's reliance decision on internal auditors because prior researchers relied on self-report techniques to gather information about the factors considered in the reliance decision. Tiessen and Colson's study showed that auditors may not accurately self-report on their thinking processes, and therefore, may not be providing the actual information that was used in making the reliance decision. They suggested that data should be gathered through techniques other than self-report.

Tiessen and Colson used data obtained directly from the internal audit directors as a non-self-reporting technique. Although information contained from internal audit directors is a technique that does not require self-report from the auditors, some subjectivity is required on the part of the directors in providing information about the auditors.

This researcher used as a non-self-reporting technique a report generated by a tracing program developed in the study. This report identified factors that the auditors examined in making the reliance decision. The report provided an objective means for examining the auditors' decision processes. The auditors participating in the study were not even aware that the program was tracking their progression through the data base.

The tracing program was organized in a manner similar to the data base. As the auditor went first to one of the three main factors, the program recorded that choice. The

next choice was one of the three or four subsections related to that particular general factor. The program recorded the auditor's choice at this second layer, and finally, each item of detailed information selected was also recorded. In addition, the program recorded the length of time that the auditor spent viewing each piece of information in the data base (including the main categories, subsections, and detailed items).

Before describing how the program was written to accomplish the tracing steps just mentioned, a general discussion of the HyperCard software development toolkit and its accompanying programming language, HyperTalk, is presented. Information contained in a HyperCard data base is organized into stacks. Data items related to a particular stack are located on cards. The individual cards in a stack include specific facts located in fields, and also navigational tools or action tools, called buttons.

If users want to view the information in a card, they simply read the data from the computer screen. If they want to view other data or navigate through the data base, they "click" on the appropriate button located on the card. Each time a user views data or clicks on a particular button, an event occurs that HyperCard can monitor. This monitoring can be accomplished through scripts written with the HyperTalk programming language. Scripts contain HyperCard commands that are carried out when a certain action or event occurs, such as clicking on a button or moving from one card to another.

For each stack, card, and button in this study's data base, the researcher wrote a script that, in essence, instructed HyperCard to track the time, order, and identification of each item viewed by individual users and to write a report of these items. These scripts were not visible to the user. They were located within the HyperCard system and

were accessible only by the researcher. Figure 3 contains an example of one of the tracing program's scripts. This script identified the piece of information that the auditor was viewing, the subsection of the data base to which the information was related, and the length of time the auditor viewed the data. The script then wrote this information to a separate report file for each subject.

Section 1 of the script (See Figure 3) identified the layer 2 factor that the auditor was viewing and the time that the auditor began viewing this factor. The script then wrote this information to a separate file outside the data base. Sections 2 and 3 recorded to the outside file the individual layer 3 factors that the auditor viewed in the order in which they were viewed. These sections of the script also recorded the times that the auditor started and stopped viewing each card. Section 4 of the script identified the time that the auditor stopped viewing the items in the layer 2 factor and also recorded the name of the layer 2 factor so that it could be easily identified in the outside file.¹²

Psychological Tests (GEFT and FIT)

This section discusses tests used to determine auditors' cognitive styles and then describes how the two tests were used together in forming the four groups.

Group Embedded Figures Test (GEFT). The Group Embedded Figures Test¹³ is designed to test for field independence/dependence. Reliability data for the GEFT are available from the Witkin, et al. [1971] study of liberal arts students, and the Pincus

¹² This is an example of only one script. Other scripts, organized in a similar manner, captured the various other factors that the auditors viewed and the times these factors were viewed.

¹³ Cantwell [1986] critiques the GEFT and discusses its extensive use in published research.

```

on openStack
  global userInfo
  put the short name of this stack && the long time && "-Begin" ~
Section 1  & return after userInfo
          open file "UserDisk:UserInfo"
          write userInfo to file "UserDisk:UserInfo"
          close file "UserDisk:UserInfo"
end openStack

on openCard
  global userInfo
  put the long id of this card && the long time & return after userInfo
Section 2  open file "UserDisk:UserInfo"
          write userInfo to file "UserDisk:UserInfo"
          close file "UserDisk:UserInfo"
          put "Card" && number of this card into field 2
          put "of" && number of last card into field 3
end openCard

on closeCard
  global userInfo
Section 3  put the long id of this card && the long time & return after userInfo
          open file "UserDisk:UserInfo"
          write userInfo to file "UserDisk:UserInfo"
          close file "UserDisk:UserInfo"
end closeCard

on closeStack
  global userInfo
  put the short name of this stack && the long time && "-End" ~
Section 4  & return after userInfo
          open file "UserDisk:UserInfo"
          write userInfo to file "UserDisk:UserInfo"
          close file "UserDisk:UserInfo"
end closeStack

```

Figure 3

Tracing Program Script Example

[1985] study of 124 practicing accountants. The Spearman-Brown Parallel Forms¹⁴ results were .82 for the Witkin, et al. study and .87 for the Pincus study. Pincus also reported Cronbach's Alpha¹⁵ of .87 for the GEFT, indicating that the test is highly reliable.

Figure 4 contains a sample item from the GEFT. In the GEFT, a simple geometric figure is hidden in a more complex figure. The subject's task is to find the simple figure in the more complex figure and outline it as shown in Figure 4. The simple figure is always the same size, in the same proportion, and faces in the same direction in the complex figure. The GEFT contains 18 items, and auditors participating in this study were given 10 minutes to complete the test, as suggested in the manual for the GEFT (Witkin, Oltman, Raskin, and Karp; 1971). Appendix E contains the instructions that were read to the auditors before they took the GEFT.

Consistent with normal scoring procedures (Witkin, et al.; 1971), the score was determined by counting the number of items correctly outlined. After all tests were scored, the median score was determined. Those auditors scoring at and above the median were classified as field independent. Those scoring below the median were classified as field dependent. This technique for grouping subjects is called the median-split technique and is often used by researchers as a way to classify subjects on the FI/FD

¹⁴ This is a reliability test in which subjects are given two parallel forms of the same test. The measure of reliability is the correlation between the two test scores.

¹⁵ This reliability test requires that subjects take the test only once. The measure of reliability includes the average correlation of the items in the test with each other (i.e., interitem correlation).

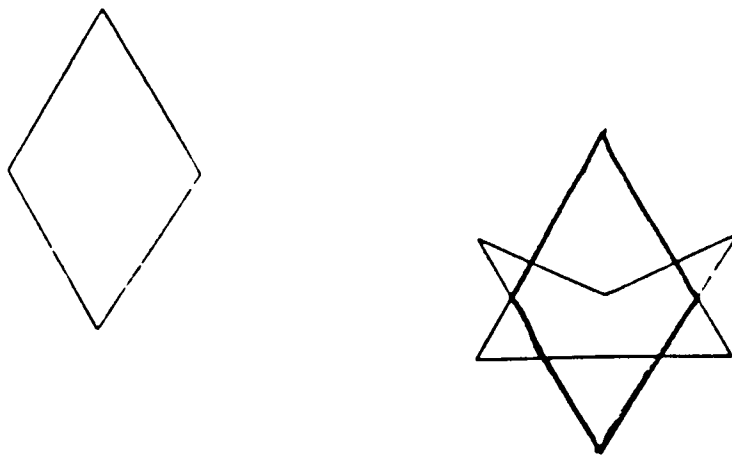


Figure 4

Group Embedded Figures Test Example

dimension when there are no acceptable classification norms (Lusk, 1973, 1979; Lusk and Kersnick, 1979; Cunningham, et al., 1988; Pincus, 1985, 1990).

Figural Intersections Test (FIT). The FIT¹⁶ was used to test subjects on the mobility-fixity dimension of field dependence/field independence. Johnson [1982] reports a split-half reliability coefficient of .88 and Cronbach's alpha of .89 for the FIT, indicating that the test is very reliable. As mentioned earlier, the FIT measures M-space. Pascual-Leone [1970] suggests that problem-solving ability depends on M-space because it is in short-term memory that reciprocal assimilation of schemes occurs, and people who can control more discrete "chunks" of information are better able to solve problems using that information. This problem-solving ability is important to the auditing environment because many audit tasks require auditors to consolidate several pieces of information in arriving at a solution.

Figure 5 presents an item from the FIT used in this study. In the FIT, two sets of figures, a presentation set and a test set, are provided. In the presentation set, several geometric figures are presented discretely. In the test set, these figures are presented in a overlapping way such that only one area of common intersection exists. The figures in the test set may be different in size from the figures in the presentation set, but will be the same shape and in the same proportion. The subject's task is to find the area of common intersection and mark it with a dot (See Figure 5). In some items, a figure appears in the test set that does not appear in the presentation set. This is called an

¹⁶ The researcher obtained written permission from the developer of the FIT to use the test in this study since it is not commercially available.

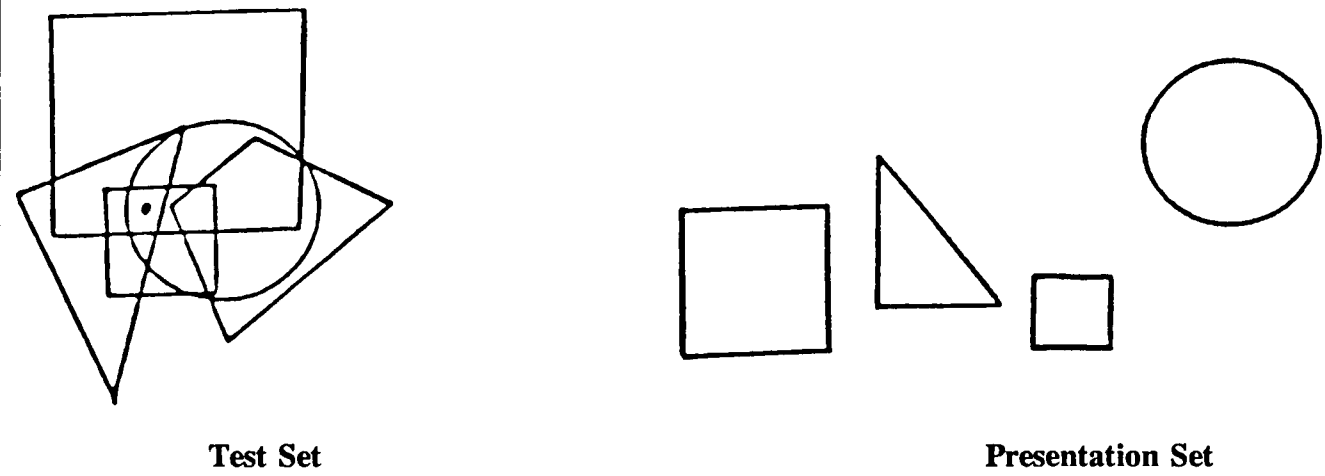


Figure 5

Figural Intersections Test Example

irrelevant figure and should be ignored by the subject in finding the area of common intersection.

The FIT contains 36 test items of varying degrees of difficulty. Difficulty of an item ranges from 2 - 10 and is determined by the number of figures in the test set¹⁷. A difficulty of 5 would indicate that the test set contained 5 shapes. The presentation set could contain 5 or fewer shapes depending on whether the test set also contained irrelevant figures. The item shown in Figure 5 has a difficulty of 5 since the test set contains the four shapes in the presentation set plus one irrelevant shape.

The researcher chose a sample of 20 items from the FIT ranging in difficulty from 5 - 10. Twenty items were chosen so that the test would not require too much time from the subjects. Items with difficulty of at least 5 were chosen because items of less difficulty were considered by the researcher to be inappropriate for an adult subject group. The auditors were given 15 minutes to complete the test. Appendix E also contains the instructions that were read to the auditors before they took the FIT. The FIT score was determined according to the scoring manual (Johnson, 1982) and in a manner similar to the GEFT score. The total number of correct items equaled the auditor's score.

GEFT and FIT combined. In one sense, the FIT is measuring field dependence/field independence because finding the area of common intersection requires that the subject disembed the area from an ambiguous context, the overlapping figures. Also, Niaz and Lawson [1985] reported a correlation of .38 ($p < .05$) between the FIT and the GEFT. When used in combination with the GEFT, however, the FIT measures

¹⁷ The test is designed for all ages, so some of the items are very easy to make the test suitable for children. Other items are more difficult and appropriate for adults.

mobility-fixity. Using Cunningham, Ridley, and Campbell's [1988] classification scheme, those FI subjects that scored high¹⁸ on the FIT were classified as fixed, since they consistently operated in a field-independent fashion. Field-independent subjects that scored low on the FIT, however, are mobile because they demonstrated diversity in their modes of functioning. Similarly, field-dependent subjects scoring low (high) on the FIT were classified as fixed (mobile). This classification scheme resulted in dividing auditors participating in the experiment into four groups, FI-mobile, FI-fixed, FD-mobile, and FD-fixed.

Subjects and Task

Two Big Six firms were asked to participate in this experiment. Five offices¹⁹ of the two firms agreed to participate. A partner at each office was contacted and asked to select only those auditors who had experience making reliance decisions on internal auditors. Audit managers and seniors were selected for this study because they have the most experience in making the overall reliance decision on an internal audit function; but in order to obtain an appropriate sample size, staff accountants who had experience making reliance decisions were also used. Big Six accounting firms were chosen because they generally have clients that are large enough to have internal audit functions, and therefore, have auditors with experience in making reliance decisions.

¹⁸ Scores at the median and above were considered high. Scores below the median were considered low.

¹⁹ Two offices were in New York, and the other three were in Tennessee (Knoxville, Nashville, and Memphis).

The auditors' task was to make a reliance decision on a hypothetical client's internal auditor by assigning audit hours in an audit program. The subjects were given a case describing the IAF and an audit program without considering the IAF to use as an anchor in making their assignment. The anchor was used so that the hours assigned to the IAF by different auditors could be compared to the same base. Without such a basis for comparison, the hours assigned might not be comparable between auditors. For example, two auditors could assign 5 hours to the IAF for a particular audit procedure. If one auditor would have assigned 5 hours to that procedure without considering the IAF and the other auditor would have assigned 10 hours to the procedure without considering the IAF, the first auditor is placing considerably more reliance on the IAF than the second auditor. Without knowing the anchors, however, one would assume equal degrees of reliance.

Those auditors who had experience with manufacturing clients were given a case in which the client was a manufacturer of small household appliances and an audit program of accounts payable (See Appendix B). Auditors who had experience with financial industry clients were given a case where the client was a bank and an audit program of deposit activities (See Appendix C). Accounts payable and deposit activities were chosen because internal auditors are generally familiar with these areas and often perform procedures related to the audit of these liabilities. In addition, SAS No. 65 states two conditions in which reliance on IAF work alone cannot reduce audit risk to an acceptable level, 1) if the risk of material misstatement of assertions related to a particular financial statement amount is high, and 2) if the degree of subjectivity involved in

evaluating the audit evidence related to those assertions is high (AICPA, 1991 par. 20-22).

Accounts payable and deposit activities were considered areas where the amount of risk and subjectivity were moderate, and therefore, reliance on the IAF would be appropriate.

The audit programs included audit steps for tests of controls and for tests of balances, so the auditors could rely on internal auditors' work in either section of the audit or both sections. Although actual audit programs often contain 50 or more steps, the audit programs used in this experiment combined several procedures into one step and listed only the most relevant procedures to save auditors' time. In spite of the condensed nature of these audit programs, all five categories of financial statement assertions were included in the audit program steps.²⁰

The order in which the experimental materials were administered was randomized to reduce the possibility of systematic bias in the auditors' responses. Some auditors were given the psychological tests first, and then the case. Some were given the case first, and then they completed the psychological tests. Others were given one test, then the case, and finally, the other test. Auditors also completed debriefing questionnaires at the end of the experiment, which requested demographic data and asked the participants about the realism of the task.²¹ Appendix F contains the debriefing questionnaire used in this study.

²⁰ SAS No. 31 classifies financial statement assertions into the following five categories: 1) existence or occurrence, 2) completeness, 3) rights and obligations, 4) valuation or allocation, and 5) presentation and disclosure (AICPA, 1980, AU 326).

²¹ Two participants did not complete debriefing questionnaires. Those auditors who did complete the questionnaire indicated that the materials presented in this experiment were realistic.

Pilot Study

The experimental materials were pretested at a continuing education seminar held by the Knoxville chapter of the Tennessee Society of CPAs. The pilot study was conducted in two phases. First, the researcher conducted a one-hour discussion of SAS No. 9 and the SAS No. 65 exposure draft²². Second, the pilot study participants completed the two psychological tests (Group Embedded Figures Test and Figural Intersections Test) and the case analysis. After the participants finished the case materials, they completed a debriefing questionnaire that included questions about the realism of the materials and asked the participants to provide suggestions for improvement to the materials. The pilot study results indicated that the experimental materials were realistic, and only minor changes were made to the data base as a result of participants' suggestions.

Conducting the Experiment

Two firms, Price Waterhouse and KPMG Peat Marwick, participated in this study. The experiment was conducted somewhat differently for the two firms, so each will be discussed separately in this section.

Price Waterhouse

The national and practice offices in New York provided 12 subjects for the experiment. The experiment was conducted at the practice office. Because Price

²² The pilot study was conducted before SAS No. 65 was issued.

Waterhouse (PW) uses IBM computers and the data base was developed using Macintosh computers, it had to be converted to an IBM format before the experiment could be conducted.²³

The researcher was always present during the experiment to answer any questions the auditors had regarding the case or the data base and to administer the psychological tests²⁴. The 12 subjects participated over a two-day period.

KPMG Peat Marwick

Three KPMG Peat Marwick offices participated in the experiment on two different days providing a total of 39 subjects. The researcher contacted a managing partner at each office to schedule the experiment during a training seminar, ensuring that several seniors and managers would be in the office and available for participation. The Knoxville and Nashville offices participated during a joint seminar in Nashville, and the Memphis office also participated during a continuing professional education seminar.

Since KPMG uses Macintosh computers, the experiment was conducted at the Nashville and Memphis computer training facilities. The experiment was conducted in a manner similar to the New York experiment; that is, the researcher was present during the entire experiment and had complete control over how the experiment was conducted. The 21 subjects from the Knoxville and Nashville offices participated in two different

²³ The IBM software that is comparable to HyperCard is called Plus by Spinnaker. Plus is almost 100 percent compatible with HyperCard so only minor changes had to be made to the data base before it could be used on IBM computers.

²⁴ No significant questions were asked during any of the sessions.

sessions²⁵, but the 18 subjects from the Memphis office completed the experiment in a single one-hour session.

Descriptive Statistics

Demographic information was obtained from the participants through a debriefing questionnaire (See Appendix F). Table 2 presents the current position of those participating in the study.

Table 3 categorizes the auditors' experience in their current position, in public accounting, and their experience in making internal auditor reliance decisions. Newest personnel who participated appeared to be experienced in making this decision. The staff accountants in the study had an average of almost 1 1/2 years of experience in public accounting and almost four months' experience making reliance decisions.

Tables 4 - 6 present data relating to the subjects' highest degree and certificates held, their gender, and average age. One interesting item from Table 4 is that only 8 (16.3%) of those participating in this study for which demographic data were available had masters degrees, and most of these were at the senior or staff level. Only 2 managers and no senior managers had advanced degrees. In addition, 40 (81.6%) auditors were CPAs.

Table 5 presents the gender of the participants in total and by position. Females represented 27.5% of the participants in this study. The majority of these females were

²⁵ Two sessions were necessary because the auditors from the Knoxville office arrived later than the auditors from the Nashville office.

at the senior or staff level. Only 1 manager participating in this study was female. These numbers accurately reflect the public accounting environment. Although 50% or more of recent hires are women, only 14% of managers and 3% of partners are women in the largest CPA firms (Hooks and Cheramy, 1989).

Table 6 presents the mean age of the auditors by gender and position. As is evidenced in this table, the auditors who participated in this study form a relatively homogeneous group.

CHAPTER 4

RESULTS

This chapter presents the results of the data analyses and is organized according to the three research phases presented in Chapter 3. The first section discusses how the auditors' cognitive styles were determined. The next section discusses comparing the reliance decisions among those groups. Finally, the last section presents the examination of the auditors' decision processes as they made the reliance decisions.

Determining Auditors' Cognitive Styles

Before any research hypotheses could be tested, the researcher had to determine the cognitive styles of the auditors participating in this study. This was accomplished by dividing the auditors into four groups based on their responses to two cognitive style tests, the GEFT and the FIT.

Formation of Cognitive Style Groups

Table 7 presents the distribution of the GEFT scores for the 51 auditors participating in this study. As the table illustrates, the GEFT scores ranged from 2 to 18, with 18 being a perfect score. The median score was 14, the mean was 12.53, and the standard deviation (SD) was 4.59. These results are higher than the Witkin et al. [1971]

original norms for liberal arts students (mean = 11.27; SD = 4.16) and the Pincus [1985] norms for practicing accountants (median = 12.23; mean = 11.61; SD = 4.42).

The researcher divided the auditors into two groups, field dependent and field independent, using their GEFT scores. The median score was determined, and those auditors who scored at or above the median were classified as field independent. Those auditors scoring below the median were classified as field dependent. This division of auditors based on GEFT scores resulted in 27 field-independent auditors and 24 field-dependent auditors.

These two groups were further divided into two more groups based on FIT scores. Using the same technique as was used with the GEFT scores, the median FIT score was determined. Each FI and FD auditor's GEFT score was matched with that auditor's FIT score. Table 7 also presents the FIT score distribution. The scores ranged from 5 to 20, with 20 being a perfect score. The median FIT score was 15, the mean was 13.69, and the SD was 4.40.²⁶

Those FI auditors (i.e., those scoring at or above the median on the GEFT) who also scored at or above the median on the FIT were classified as FI-fixed. Those FI auditors who scored below the median score on the FIT were classified as FI-mobile. Similarly, those FD auditors (i.e., those scoring below the median on the GEFT) who scored below the median on the FIT were classified as FD-fixed; and those FD auditors

²⁶ Norms for the FIT are unavailable. Although Niaz [1987] used the FIT in his study, the version he used contained 31 items ranging in difficulty from 2 - 8; therefore, his mean scores cannot be compared to this study's FIT scores.

who scored at or above the median on the FIT were classified as FD-mobile. The following diagram illustrates the formation of the cognitive style groups.

FIT	GEFT	
	At/above median	Below median
At/above median	FI-Fixed	FD-Mobile
Below median	FI-Mobile	FD-Fixed

As Table 7 illustrates, the 27 FI auditors were further classified into 19 FI-fixed auditors and 8 FI-mobile auditors based on their FIT scores. The 24 FD auditors were further classified into 16 FD-fixed and 8 FD-mobile auditors.

Discussion of Cognitive Style Groups

As discussed in Chapter 2, cognitive style refers to the organization and processing of information. Cognitive style, then, measures a process variable and not an ability or intelligence variable (Witkin et al., 1977). Differences among the four cognitive style groups will reflect the auditors' distinct approaches to organizing and using the available information and the effect that these processing methods have on the ultimate outcome or reliance decision. Before the results related to those differences are presented, a brief discussion of the four cognitive style groups is warranted.

Field independent-fixed. As Table 7 shows, the FI-fixed group contained more auditors (19 or 37% of the total) than did any other cognitive style group. Auditors in

this group scored at or above the median score on both the Group Embedded Figures Test and the Figural Intersections Test. Scoring at or above the median on the GEFT indicated that these auditors were field independent. That is, they process information at such a detailed level that they can overcome the embedded contexts in which the information is presented.

Also scoring at or above the median on the FIT indicated that these auditors were not only field independent, but that they were also fixed. FI-fixed means that the auditors always operate in a field-independent fashion. In other words, they always process information in a detailed manner regardless of how the information is presented.

Field independent-mobile. Eight auditors (16%) were classified as FI-mobile. These auditors scored at or above the median on the GEFT but scored below the median on the FIT. Auditors with this cognitive style can overcome embedded contexts in processing information (i.e., process in a field-independent style), but can also vary their information processing methods depending on the manner in which the information is presented.

In other words, field independent-mobile auditors do not always process information using a detailed procedure. If data are contained in an embedded context, the FI-mobile auditor will process the data independently of the context in which they are presented. If information is presented in a straightforward context, however, the FI-mobile auditor will process the information in a very general manner, not necessarily in a field-independent manner.

Field dependent-fixed. Sixteen auditors (31%) were classified into the FD-fixed cognitive style group. These auditors scored below the median on both the GEFT and the FIT. Scores below the median on both tests indicate that these auditors are dominated by the context in which information is presented, and therefore, do not perceive information independently of context. They process sets of information in their entirety rather than extracting specific pieces of data for analysis. In addition, FD-fixed auditors always use this method for processing information. That is, even if a data set contains irrelevant data, FD-fixed auditors process the entire set.

Field dependent-mobile. Finally, eight auditors (16%) fit into the FD-mobile category. These auditors scored below the median on the GEFT (placing them in the FD category), but they scored at or above the median on the FIT. This combination of scores placed them in the FD-mobile group. Auditors with this particular cognitive style usually process information in a field-dependent manner, but occasionally can vary their processing methods and perceive information independently of the context in which it is presented.

Descriptive statistics. Tables 8 and 9 contain descriptive statistics for the four groups in this study.²⁷ Notice from Table 8 that most of the auditors in each group were seniors and that relatively the same percentage of staff accountants appear in each group.

What is interesting to note from Table 8, however, is the make-up of senior managers in each group. In the two mobile groups (FI-mobile and FD-mobile), senior

²⁷ The auditors' reliance decisions were tested for differences between the two firms participating in this study. Since no significant differences were found, the data from the firms were combined for analysis.

managers constitute 26.7% of the combined total (28.6% for FI-mobile, 25.0% for FD-mobile). In the fixed groups (FI-fixed and FD-fixed), however, only 5.9% of the auditors were senior managers (5.3% for FI-fixed, 6.7% for FD-fixed). This same difference did not occur in the field-dependent and field-independent groups. In the field-dependent groups (FD-fixed and FD-mobile), senior managers made up 13% of the total; and 11.5% of the auditors in the field-independent groups (FI-fixed and FI-mobile) were senior managers.

Similarly, Table 8 shows that the majority of auditors in three of four positions (manager, senior, and staff) were in the fixed cognitive style groups (83% of managers, 73% of seniors, and 72% of staff). The senior managers were the only auditors with a majority (66%) in the mobile groups.

Table 9 shows that males dominated each group. Table 9 also shows that most of the field-dependent auditors had bachelors degrees only, while several field-independent auditors also had masters degrees.

Finally, FI-fixed auditors had the least amount of experience in public accounting (average of 3.5 years), while FI-mobile auditors had the most experience (average of 5.2 years). When combined, mobile auditors had on average 4.67 years of public accounting experience, and fixed auditors had 3.90 years on average. Field-dependent auditors had 4.34 years of experience and field-independent auditors had 3.95 years. These experience means were tested for differences using a t-test. The results show no significant differences between experience for neither the mobile and fixed groups ($p=.1810$) nor for the field-dependent and field-independent groups ($p=.1914$).

The next section presents the results of comparisons of auditors' reliance decisions in these four groups.

Comparing Reliance Decisions

Two basic assumptions of one-way analysis of variance are that the data are from normally distributed populations and that the population variances are equal (Neter, Wasserman, and Kutner, 1985). To ensure that these assumptions were not violated, tests for normality and equality of variances were conducted before the research hypotheses were tested.

Normality and Equality of Variance Tests

To test the null hypothesis that the data were from normally distributed populations, the Shapiro-Wilk²⁸ test for normality was conducted. In addition, normal probability plots and boxplots were also prepared to compare the distribution of this study's data to a normal distribution.

The results of the Shapiro-Wilk normality test indicated that the data deviated somewhat from a normal distribution. The plots of the data show, however, that the distribution was only slightly skewed; therefore, the deviation from normality was not substantial.

To test for equality of variance among the four groups, a variant of Levene's [1960] test was used. The traditional Levene's test uses the absolute deviations of the

²⁸ This test is part of the PROC UNIVARIATE procedure in SAS.

observations in each group from that group's mean. A one-way ANOVA is then performed on these absolute deviations. The null hypothesis tested is that the means of the groups are equal. If the null hypothesis cannot be rejected, the assumption of equality of variances among the populations is not violated.

The variant of Levene's test that was used in this research does not assume that the data are from normally distributed populations. This test used the absolute deviations of the observations in each group from that group's median. Although the data in this study did not deviate substantially from the normality assumption, this variant of Levene's test was believed a more conservative test for equality of variances.

The F-statistic for the one-way ANOVA was .59. These results indicate that the null hypothesis of equal variances cannot be rejected, and therefore, the assumption of equal variances among the populations was not violated.²⁹

Discussion of Variables

Before the statistical results are presented, a brief discussion of the dependent variables and the test for industry differences is provided.

Dependent variables. The auditors participating in this study completed audit programs by assigning hours to specific procedures for accounts payable or deposit activities depending on their audit expertise (See Appendices B and C for copies of the related audit programs). The audit programs were divided into two sections, tests of controls and substantive tests. Each section contained several audit steps and planned

²⁹ SAS recommends that PROC GLM procedures be used for ANOVA when the data are in an unbalanced design. (SAS Institute, 1989, p.23). Therefore, ANOVA procedures in this study were tested using PROC GLM.

audit hours for each step assuming that no internal audit department existed. The auditors were instructed to adjust the number of hours assigned for each step according to their degree of reliance on the internal audit department.

The audit hours they indicated on the audit program were the planned hours for their audit staff after reviewing the information related to the IAF. The amount of reliance on the IAF for each audit step was the difference between the planned hours assuming no IAF and the planned hours indicated by the auditors after making their reliance decision. The instructions that were given to the auditors for preparing the audit programs are included in Appendices B and C.

When the first three hypotheses were tested, the overall reliance decision was used as the first dependent variable. This overall decision was divided into the total number of hours assigned to each section. This resulted in three dependent variables for analysis: 1) audit hours assigned (by way of reduced external audit hours) to internal audit for tests of controls, 2) audit hours assigned to internal audit for substantive tests, and 3) total audit hours assigned to internal audit.

The dependent variables used for the fourth hypothesis were compiled from the tracing program reports of the auditors' decision processes. The fourth hypothesis dealt with the use of different factors in forming the reliance decision. Since the thought processes of an auditor making a reliance decision cannot be monitored directly, surrogates for the use of factors had to be determined. Three general surrogates were chosen to indicate use of factors: 1) the number of times a factor was viewed, 2) the length of time a factor was viewed, and 3) the order in which factors at a particular layer

in the data base were viewed. If an auditor chose to go back to a factor and view it a second or third time, one could argue that the auditor was using that factor in forming the decision. Similarly, if one factor was viewed longer than others, an argument could be made that the factor was important to the decision.³⁰ Finally, if the order in which factors were viewed was different among auditors, one could argue that the auditors used the factors in different ways in forming the decision.

Since the data base was organized into three layers, those surrogates that best fit each layer were chosen for testing. This resulted in five dependent variables: 1) order of layer 1 factors searched (competence, objectivity, and work performance), 2) the length of time spent viewing each layer 1 factor, 3) order of layer 2 factors searched (e.g., Organizational reporting level, independence, and top management support were layer 2 factors for objectivity.), 4) the layer 2 factors viewed most³¹, and 5) the layer 3 factors viewed most (e.g., Internal audit department reports findings directly to audit committee chairman was one item in the organizational reporting level layer.)³².

These dependent variables were tested on combinations of the four cognitive style groups. For example, the first hypothesis tested for differences between mobile and fixed groups; therefore, the decisions of the FD-mobile and the FI-mobile groups were combined and compared to the decisions of the FD-fixed and FI-fixed groups combined.

³⁰ This assumes, of course, that the amount of information contained in each factor is the same. In this study, most of the data items were relatively the same length.

³¹ The auditors could view layer 2 factors as often as they desired. The number of times a layer 2 factor was viewed was tallied for each auditor.

³² The layer 3 factors within a particular layer 2 factor could be viewed in only one order; therefore, layer 3 factors were often viewed the same number of times. In those cases, the length of time a layer 3 factor was viewed indicated its use.

Industry differences. Tiessen and Colson [1990] found that auditor reliance on internal auditors varied significantly across nine industries. Because the manufacturing and finance industries accounted for most of their cases, these two industries were also used in this research to test Tiessen and Colson's assertion that client industry has a significant effect on auditor reliance. Thirty-two auditors requested the manufacturing case because their expertise was with manufacturing clients. Nineteen auditors requested the finance case because they had experience with finance industry clients.

T-tests were performed on each group (FI-fixed, FI-mobile, FD-fixed, FD-mobile) of reliance decisions to determine if the reliance on internal auditors differed depending on the industry in which the audit client operated. The overall reliance decision, the tests of controls reliance decision, and the substantive tests reliance decision were all tested for differences. Table 10 contains the results of the tests for industry differences.

The t-test results showed that the overall reliance decisions for the manufacturing and finance industries were significantly different for only the FI-mobile group ($t=2.67$). Further analysis indicated that this difference was due mainly to the substantive tests decisions. The t-statistic for the FI-mobile group's substantive tests reliance decision was 3.07, whereas the t-statistic for the test of controls decision was only 1.06.

Analysis of the means for the overall reliance decision shows that the FI-mobile auditors assigned significantly more hours to the internal auditors in the finance industry case (76.5 hours) than they did in the manufacturing case (41.7 hours). Again, most of this difference occurs in the substantive tests decision where the finance industry case received 55 hours, and the manufacturing case received 26.7 hours. For the tests of

controls reliance decision, the finance industry case received 21.5 hours from the FI-mobile auditors, and the manufacturing case received 15 hours.

Because these results did not support Tiessen and Colson's assertion of an industry effect, additional t-tests were conducted. The reliance decisions were converted from hours of reliance to percentage changes in hours. T-tests were performed on the percentage change in overall audit hours, the percentage change in tests of controls audit hours, and the percentage change in substantive tests audit hours. None of these tests were significant at the .10 level.

Finally, one test of control procedure and one substantive test procedure from each industry's audit program were tested for differences in the degree of reliance. The procedures chosen were those for which the IAF was expected, a priori, to have the greatest impact, and therefore, receive the most reliance from the auditor. The IAF was expected to have the greatest impact on those procedures for which they had the most expertise and on those assertions for which the evaluation of audit evidence was objective (i.e., existence and completeness).³³ None of the t-tests were significant at the .10 level. Since a significant difference between industries was found for only one cognitive style group, the data from the two industry cases were combined in the subsequent analyses.

³³ The accounts payable procedures tested were: 1) compliance with company policies regarding purchasing and receiving and 2) review of year-end cutoff. The deposit activities procedures tested were: 1) detective controls and 2) confirmation of deposit liabilities.

Comparisons Between Mobile and Fixed Auditors

Niaz [1987] argued that mobile subjects perform better than fixed subjects on problems where the solution requires separating out critical pieces of information. He further argued that fixed subjects perform better than mobile subjects on formal analytical tasks. Since most audit tasks require separating out information, mobile auditors should make better reliance decisions than fixed auditors. Determining a better reliance decision is difficult, however, so the first research hypothesis relates in a more general way the relationship between mobile and fixed auditors:

Hypothesis 1: Mobile and fixed auditors will make significantly different reliance decisions.

This hypothesis was tested using one-way ANOVA³⁴ for the overall reliance decision, the tests of controls reliance decision, and the substantive tests reliance decision.

Table 11 shows the ANOVA results for the reliance decisions. Notice that the F-statistic for the overall reliance decision was 5.02. This provides strong support for Hypothesis 1. The F-statistic for the substantive tests decision was 7.22, providing even stronger evidence in support of the research hypothesis. Also notice, however, that Hypothesis 1 was not supported for the tests of controls reliance decision ($F=.39$).

An examination of the mean responses for the two groups shows that the mobile auditors consistently placed more reliance (in the form of reduced audit hours) on the internal auditors (48.75 hours, overall; 14.31 hours, tests of controls; 34.44 hours,

³⁴ Specifically, the mobile and fixed groups were compared using CONTRAST statements within the PROC GLM procedure of the SAS statistical package. PROC GLM was used because of the unbalanced design (i.e., unequal sample sizes in the four groups). The CONTRAST statements were used to combine the results of the two mobile groups (FD-mobile and FI-mobile) and compare that result with the combined results of the two fixed groups (FD-fixed and FI-fixed).

substantive tests) than did the fixed auditors (33.91 hours, overall; 12.72 hours, tests of controls; 21.19 hours, substantive tests), but only the overall and substantive tests means were significantly different.

Notice also from Table 11 that R-Square for the overall reliance decision was .108, and R-Square for the substantive tests decision was .145. These figures represent the amount of variation in the overall and substantive tests decisions that was due to differences among the four cognitive style groups. The analysis further indicates that the differences between the mobile and fixed groups account for most of this variation.³⁵

Since this was the first attempt to study mobility-fixity in an auditing setting, there are no benchmarks with which to compare these results; but they do suggest, however, that mobility-fixity was an important dimension of cognitive style to this study.

Comparisons Between FD and FI Auditors

Several accounting researchers have studied the effect of field dependence and field independence on accounting decisions. Lusk [1973, 1979], Benbesat and Dexter [1979], and Lusk and Kersnick [1979] studied this effect in an information systems setting. They found that field dependence/field independence affects an accountant's preference for information but does not affect the final outcome or decision.

This research tested a similar hypothesis in an auditing setting:

Hypothesis 2: Field-dependent and field-independent auditors will **not** make significantly different reliance decisions.

³⁵ The sums of squares for the specific tests between mobile and fixed groups were 2,411 (overall) and 1,922 (substantive tests). The sums of squares for all four groups was 2,726 (overall) and 2,130 (substantive tests).

This hypothesis was also tested using one-way ANOVA for the overall reliance decision, the tests of controls reliance decision, and the substantive tests reliance decision.

Table 12 presents the ANOVA results for Hypothesis 2. None of the test results are significant at the .10 level. In this case, however, these results provide strong evidence in support of Hypothesis 2. Recall that no difference in the reliance decisions of field-dependent and field-independent auditors was hypothesized. Since the null hypothesis being tested in the ANOVA procedure is that the group means are equal, failing to reject the null hypothesis supports the research hypothesis of no differences between the two groups.

The mean responses for the overall, tests of controls, and substantive tests decisions provide further evidence that the field-dependent and field-independent auditors did not differ significantly in their reliance on the internal audit department. For the overall reliance decision, the field-dependent auditors assigned 38.92 hours on average to the internal audit department; whereas the field-independent auditors assigned 43.74 hours on average. For the tests of controls decision, the FD auditors assigned 12.14 hours, and the FI auditors assigned 14.89 hours. Finally, for the substantive tests decision, FD auditors assigned 26.78 hours and the FI auditors assigned 28.85 hours. Although these means show that the field-independent auditors relied more on the internal auditors (by assigning more hours to them), the reliance was not substantially different from that of the field-dependent auditors.

Comparisons Between FI-fixed Auditors and Others

Haronian and Sugerman [1967] suggested that FI-mobile subjects can become confused while working complex cognitive tasks because they have many possible solutions to problems. Based on this assertion and on prior research that showed field-independent subjects generally outperform field-dependent subjects, Cunningham et al. [1988] hypothesized that FI-fixed subjects would perform better than other cognitive style subtypes (i.e., FI-mobile, FD-fixed, and FD-mobile).

A general version of this hypothesis was tested in this study of auditors' reliance on internal auditors:

Hypothesis 3: FI-fixed auditors will make significantly different reliance decisions from other cognitive style subtypes (FI-mobile, FD-fixed, and FD-mobile).

One-way ANOVA³⁶ was used to test this hypothesis for the overall reliance decision, the tests of controls decision, and the substantive tests decision.

Table 13 presents the ANOVA results for Hypothesis 3. None of the tests for this hypothesis were significant at the .10 level. For the overall reliance decision, the F-statistic was .76, indicating no support for the hypothesis that FI-fixed auditors placed a significantly different amount of reliance on the internal auditors from FI-mobile, FD-fixed, and FD-mobile auditors. For the tests of controls decision, the F-statistic was .04, and for the substantive tests decision, the F-statistic was 1.14, again providing no support for the research hypothesis.

³⁶ CONTRAST statements were used to test Hypothesis 3 so that the FI-fixed group's mean response could be compared to the other 3 groups combined.

Since the hypothesis tested the FI-fixed group's response against the other three groups combined responses, the researcher tested the FI-fixed group against each of the other three groups individually to ensure that one group was not driving the results of the combined tests. None of these tests were significant at the .10 level for the overall decision, the tests of controls decision, and the substantive tests decision.

Examining Auditors' Decision Processes

One of the major objectives of this study was to examine auditors' decision processes on reliance on the IAF. The purpose of this examination was twofold: 1) to determine how cognitive style affects the reliance decision process, and 2) to provide an objective analysis of the factors used in the decision process.

Cognitive Style Effects on Decision Process

Hypothesis 2 stated that field-independent and field-dependent auditors would not make significantly different reliance decisions. The support for this hypothesis stems from accounting researchers (Lusk, 1973, 1979; Benbesat and Dexter, 1979; Lusk and Kersnick, 1979) who have studied cognitive style in an information systems setting. These same researchers also reported that cognitive style, although it does not affect decision outcome, does affect preference for information; therefore, it affects the decision process.

This assertion was tested in an auditing setting with the following hypothesis:

Hypothesis 4: Field-dependent and field-independent auditors will use different factors in forming the reliance decision.

Hypothesis 4 was tested with t-tests and a series of Chi-Square and Fisher's Exact Tests for independence³⁷ using data compiled from the tracing program reports generated for each auditor participating in this study.

Appendix G contains a sample tracing program report. The auditor's identification number³⁸ and the date were listed at the top of each report. Then the report listed the layer 1, layer 2, and layer 3 factors in the order in which they were retrieved. In addition, the time that each factor was presented to the auditor for viewing and the time that each factor was removed by the auditor were also recorded.

Recall from an earlier discussion that five dependent variables were tested in Hypothesis 4: 1) order of layer 1 factors searched, 2) the length of time spent viewing each layer 1 factor, 3) order of layer 2 factors searched, 4) the most often viewed layer 2 factors, and 5) the most often viewed layer 3 factors. For each of these dependent variables, tests for significant differences between field-independent and field-dependent auditors were performed. The following paragraphs discuss each dependent variable separately.

Order of layer 1 factors. Professional standards suggest that auditors evaluate three general factors related to internal auditors, 1) the internal auditors' competence, 2) their objectivity, and 3) their work performance. The data base used in this research was

³⁷ T-tests were used for one variable, time spent viewing the data base; tests for independence were used for the other variables because the data compiled from the tracing program reports consisted of frequencies.

³⁸ Identification numbers were assigned to each auditor to ensure anonymity.

organized around these three general factors. The auditors could view information related to any of these factors at their choice.

In both groups (field-dependent and field-independent), more auditors viewed objectivity information first. In the field-dependent group, 13 of 24 (54%) auditors viewed objectivity information first; and in the field-independent group, 15 of 27 (55%) auditors viewed objectivity information first. Some auditors, however, (10 from each group or 42% of FD and 37% of FI) examined competence information first. Only one field-dependent auditor and two field-independent auditors viewed work performance information first. The orders in which the layer 1 factors were viewed were tallied for each auditor within the field-independent and field-dependent groups. These totals were then tested for differences using Fisher's Exact Test for independence.³⁹

Table 14 presents the test results for the orders of layer 1 factors viewed most by the field-dependent and field-independent auditors. For those auditors who viewed objectivity first (13 FD and 15 FI auditors), most (10 FD and 13 FI) viewed competence information next, and work performance information third. Of those who started with competence information (10 FD and 10 FI auditors), many (4 FD and 8 FI) viewed objectivity information second and work performance information third. These two orders plus a third category for all other orders were tested for differences between the two groups.

³⁹ Chi-square tests are valid only if there are no cells with a value of 0 or no cells have an expected value of less than 5. If these conditions were met, Chi-square tests were conducted. If the conditions were not met, Fisher's Exact tests were used.

The test for general association between cognitive style (i.e., FD/FI) and order of layer 1 factors searched was not significant at the .10 level. The p-value for Fisher's Exact Test⁴⁰ was .306, providing little evidence to support the assertion that field-dependent and field-independent auditors used different layer 1 factors (i.e., competence, objectivity, and work performance) in forming the reliance decision.

This finding is not too surprising, however, given that only three layer 1 factors existed. What is interesting to note is that only 6 percent of the auditors viewed work performance information before viewing any competence or objectivity data. SAS No. 65 states that competence and objectivity of internal auditors should be assessed before proceeding to work performance evaluation. The evidence from this study indicates that auditors in practice are doing what the authoritative literature prescribes.

Time spent viewing layer 1 factors. Another way to test for differences between field-dependent and field-independent auditors' use of factors was to examine the total amount of time that each group spent viewing competence, objectivity, and work performance information. If one group spent significantly more time than the other group viewing any part of the data base, then an argument for use of different factors could be made.

Notice from the tracing program report (See Appendix G) that the time an auditor began looking at competence information was recorded, and the time that the auditor stopped looking at competence information was recorded. These beginning and ending times were also recorded for objectivity and work performance information.

⁴⁰ Fisher's Exact Test was used because the expected frequency for two cells was less than 5, indicating that Chi-Square may not be a valid test.

For each auditor, the researcher subtracted the beginning time from the ending time to obtain a total amount of time spent on each layer 1 factor. If an auditor viewed a layer 1 factor more than once, the researcher added the times together so that each auditor had only one recorded time for competence, objectivity, and work performance factors. These times were tested for differences between the field-dependent and field-independent auditors using t-tests.

Table 15 shows that FD and FI auditors differed significantly in the amount of time they viewed competence information ($t\text{-statistic}=2.275$), but the tests for objectivity and work performance were not significant at the .10 level. These results provide support for the assertion that FD and FI auditors use different factors in forming the reliance decision, at least in the competence area.

Table 15 also shows the average times that the FD and FI auditors viewed competence, objectivity, and work performance information. Interestingly, FD auditors spent more time than FI auditors viewing the information in each of the three categories. One explanation for this difference comes from the psychology literature. Several studies have shown that field-dependent subjects tend to use global strategies in problem solving, whereas field-independent subjects use analytic strategies (Witkin et al., 1977; O'Connor and Blowers, 1980; Clark and Roof, 1988). A global strategy requires processing of the entire set of information about the problem, whereas an analytic strategy requires processing of only critical pieces of information about the problem. This additional processing is perhaps the reason the FD auditors took more time than FI auditors to view the information in the data base.

Order of layer 2 factors. Once an auditor chose a layer 1 factor for viewing, the data base provided three or four additional categories of information related to each layer 1 factor. If an auditor chose to view competence information, for example, the data base provided that auditor with four choices related to internal auditor competence: 1) internal auditors' qualifications, 2) instructions given to internal auditors, 3) internal auditors' experience, and 4) supervision and evaluation of internal auditors. Three choices were provided for objectivity: 1) organizational reporting level, 2) independence, and 3) top management support of the internal audit department. Finally, four choices related to work performance: 1) scope of internal audits, 2) supervision of internal auditors' work, 3) internal audit documentation, and 4) implementation of internal audit department findings.

Auditors could view any or all of these layer 2 factors at their discretion. The orders in which the auditors chose to view each set of layer 2 factors were recorded for the field-dependent and field-independent groups. Those orders that had a frequency of at least 2 (i.e., at least two auditors viewed the layer 2 factors in the same order) were tested for differences using Fisher's Exact Test.

Table 16 shows the test results for the layer 2 factors. The competence, objectivity, and work performance sets of layer 2 factors were tested separately. Within the competence set of layer 2 factors, the p-value for Fisher's Exact Test was .523. This finding suggests that field-dependent and field-independent auditors viewed competence factors in a similar order as they formed the reliance decision.

For the objectivity set of layer 2 factors, the p-value was .130. Although this test result is not significant at conventional levels, it provides weak evidence that field-dependent and field-independent auditors viewed objectivity factors in different orders. This finding suggests that perhaps FD and FI auditors' opinions on the factors most important to determining internal auditor objectivity differed somewhat.

The Fisher's Exact Test p-value for the work performance set of layer 2 factors was .689. This finding indicates that FD and FI auditors viewed work performance factors in comparable order, suggesting that at the layer 2 level, FD and FI auditors did not use different work performance factors in relying on internal auditors.

Most often viewed layer 2 factors. Another variable that was tested at the layer 2 level was the layer 2 factors viewed most often by FD and FI auditors. Order of viewing was seen as only one way to determine if auditors used different factors in forming the reliance decision. The layer 2 factors viewed most often was another way to assess any difference between field-dependent and field-independent auditors' use of information in forming the reliance decision.

For each FD and FI auditor, the researcher recorded the two most often viewed layer 2 factors for competence, objectivity, and work performance and tested them separately using Chi-Square tests. For competence, supervision and evaluation of internal auditors and experience were the two most often viewed layer 2 factors. For objectivity, organizational reporting level and independence were viewed most often by FD and FI auditors. Finally, implementation of internal audit findings and internal audit documentation were the most often viewed work performance layer 2 factors.

Table 17 presents the Chi-Square test results for these three tests of Hypothesis 4. Field-dependent and field-independent auditors differed significantly in their use of layer 2 factors for both competence and objectivity. The Chi-Square value for the test of competence factors was 7.893, providing strong support for the hypothesis. For the test of objectivity factors, the Chi-Square value was 12.826. Again, this result provides strong evidence that FD and FI auditors used different objectivity factors in forming their reliance decisions.

Most often viewed layer 3 factors. After choosing a layer 2 factor, auditors could examine several detailed pieces of data related to that factor. Within the experience factor, for example, were statistics on the internal audit staff's auditing experience, their experience with the company, and their experience with EDP auditing.

These layer 3 factors were arranged so that the auditors had to view them in a particular order. They could return to each layer 3 factor as often as they wanted to, but often had to view other items as well as the factor of interest. Given that the order of layer 3 factors was fixed, the researcher used the number of times a particular layer 3 factor was retrieved or the total time an auditor spent viewing a layer 3 factor as an indication of its importance.⁴¹

The researcher recorded the most often viewed layer 3 factors within each layer 2 factor for all auditors. Some layer 2 factors were viewed several times by a single auditor, creating several sets of layer 3 factor viewings as well. All sets of layer 3 factors

⁴¹ If a layer 3 factor was viewed more than once in a single viewing, that factor was deemed most important. If all layer 3 factors in a particular set were viewed only once, the factor that was viewed the longest time was considered most important.

were combined so that only one record was maintained for each auditor. These records were tested for differences between field-dependent and field-independent auditors using Chi-Square tests where appropriate and Fisher's Exact Tests when Chi-Square tests were not valid (i.e., when the expected frequency in any cell was less than 5).

The recording of the most often viewed layer 3 factors within each layer 2 factor resulted in four tests for competence, three tests for objectivity, and four tests for work performance. Table 18 shows only those tests of layer 3 factors that were significantly different for field-dependent and field-independent auditors. What is interesting to note from Table 18 is that of the 11 factors for which significant differences resulted between field-dependent and field-independent auditors, 4 were factors from SAS No. 65. The fact that seven factors included in this study's data base were from SAS No. 65 (See Figure 2) and that four were found to be significant for either FD or FI auditors suggests that perhaps the ASB accurately identified IAF factors that are important to the auditor's reliance decisions.

Within competence, three of four tests were significant at the .05 level. For the layer 2 factor, instructions given to internal auditors, the Chi-Square statistic was 6.071, indicating that FD and FI auditors differed in their use of those factors related to instructions given to internal auditors. Specifically, the factor viewed most by FD auditors was whether all internal auditors attended a two-week in-house seminar on IA department policies and procedures. For FI auditors, the most often viewed factor was whether the internal auditors complied with the Standards for the Professional Practice of Internal Auditing issued by the Institute of Internal Auditors.

For the layer 2 factor, experience, the Chi-Square statistic was 7.326. Field-dependent and field-independent auditors differed in the use of experience factors in that FD auditors viewed the internal auditors' experience with EDP auditing more, and FI auditors viewed internal auditors' tenure with the company more often in making the reliance decision.

The final layer 2 factor related to competence, supervision and evaluation of internal audit staff, had a p-value of .051 for the Fisher's Exact Test, providing support for the hypothesis that FD and FI auditors used different competence factors in forming the reliance decision. Field-dependent auditors used one supervision and evaluation factor more often than FI auditors, assignment of internal auditors to audits. Field-independent auditors used two other supervision and evaluation factors more often than FD auditors: 1) instruction and supervision of senior internal audit personnel, and 2) review of internal audit staff members by managers and review of managers by the internal audit director.

Within objectivity, two of three tests were significant at the .05 level, indicating strong support for the hypothesis of differences between FD and FI auditors' use of objectivity factors. For the layer 2 factor, independence, the Chi-Square statistic was 6.925. Within this factor, FD auditors viewed the internal auditors' authority to investigate any aspect of the entity's operations more often. FI auditors, however, focused more attention on whether the internal auditors spent time on operating responsibilities that conflicted with the internal audit role and on whether the internal audit department had policies prohibiting internal auditors from auditing areas where relatives were employed in audit sensitive positions.

The final objectivity factor for which significant results were obtained was top management support of the internal audit department. The Chi-Square statistic for this test of differences between FD and FI auditors was 6.684. Field-dependent auditors viewed the existence of formal procedures to ensure that internal audit recommendations were followed more often than the FI auditors. The internal audit director's control of hiring and firing decisions was viewed more often by the field-independent auditors.

Summary of support for Hypothesis 4. Overall, the evidence in this study supported the proposition that cognitive style affects auditors' decision processes. The most compelling evidence came from the layer 2 and layer 3 factors viewed most often by the field-dependent and field-independent auditors. The auditors' use of these factors differed significantly for both competence and objectivity information.

Use of Factors

The second part of the examination of auditors' decision processes centered around the factors that were considered in the reliance decision. Tiessen and Colson [1990] criticized self-report techniques for gathering data about the factors used in reliance decisions because auditors have poor self-insight into their decision processes. This researcher used the tracing program as a non-self-report technique for gathering information about those factors considered in auditors' reliance decisions. The following paragraphs report the findings of this examination according to the three layers of factors in the data base and compares those findings with prior research.

Layer 1 factors. Auditors in this study considered objectivity factors most often in relying on internal auditors. Competence was the second most often used factor, and

work performance was the third. If use is equated with importance, objectivity was the most important factor to auditors' reliance decisions in this study. This finding contradicts prior research on the importance of factors to the reliance decision. In fact, no prior study found objectivity to be the most important factor. Most studies found work performance or a combination of competence and work performance to be most important (Brown, 1983; Schneider, 1984, 1985; Margheim, 1986). One study (Messier and Schneider, 1988) reported that competence was the most important factor followed by objectivity and then work performance.

Layer 2 factors. Experience was the most often used competence factor for FD auditors, and supervision and evaluation of internal auditors was the most often used competence factor for FI auditors in this study. Organizational reporting level was the most often used objectivity factor for FD auditors, and independence was the most often used objectivity factor for FI auditors. Implementation of findings was the most often used work performance factor for FD auditors in this study, and documentation was the most often used work performance factor for FI auditors.

Again, equating use with importance, these findings for competence and objectivity are similar to prior studies. Messier and Schneider [1988], the only other study that arranged information in three layers, reported experience was the most important competence factor in their study, consistent with FD auditors in this study.

Similarly, they reported independence was the most important objectivity factor, which is consistent with FI auditors in this study. Two other studies reported independence as the most important objectivity factor as well (Clark et al., 1980; Brown,

1983). Abdel-khalik et al. [1983] reported that organizational reporting level was the most important objectivity factor in their study, which is also consistent with this study's finding for FD auditors.

The work performance factors used most often, and therefore, deemed most important in this study, documentation and implementation of findings, were inconsistent with prior research. Clark et al. [1980] and Messier and Schneider [1988] reported that adequate scope of internal audits was the most important work performance factor. Adequate scope was the third most important work performance factor in this study.

Layer 3 factors. Since Messier and Schneider's [1988] study was the only one arranged in a hierarchy similar to this study's hierarchy, the layer 3 factors in this study that correspond to their layer 3 factors were compared. Within the experience factor, FD auditors in this study considered experience in EDP as most important, whereas FI auditors considered experience with the company as most important. Messier and Schneider's subjects considered auditing experience as most important.

Within the independence factor, the results of this study and Messier and Schneider's study are the same. Freedom from operating responsibilities that conflict with the internal audit role was the most important factor to both FD and FI auditors in this study and to the auditors in Messier and Schneider's study.

Finally, the important work performance factors in this study are different from Messier and Schneider's because the layer 2 factors did not agree. For this study's FD auditors, the most important work performance factors were whether internal auditors' recommendations were followed and whether conclusions in the audit reports were

consistent with the evidence collected. The FI auditors in this study considered whether internal auditors' recommendations were followed was the most important work performance factor. In Messier and Schneider's study, the number of items examined in the internal audit was the most important work performance factor.

Consensus of Auditors

As previously discussed, prior studies of auditors' reliance on IAFs provided mixed results on the degree of consensus among auditors. Consistent with this prior research, consensus was measured for the auditors in this study by correlating the reliance decisions of all pairs of auditors. In addition, the reliance decisions of auditors within the four cognitive style groups were also correlated in an attempt to establish a relationship between cognitive style and consensus, and therefore, provide a possible explanation for the mixed results in prior studies. Pearson's product moment correlations were used because the data in this study were assumed to be from a normally distributed population and the reliance decisions were continuous variables.

The Pearson correlation for all pairs of auditors was .341, indicating a moderate degree of consensus. The correlations for the four cognitive style groups, however, present varying degrees of consensus. The FI-mobile group's correlation was .918, indicating almost total agreement among those auditors' reliance decisions. Consensus was also high among FD-mobile auditors ($r=.616$). Among FI-fixed auditors, however, consensus was low ($r=.108$); and the correlation of FD-fixed auditors' reliance decisions was .399, suggesting a moderate degree of consensus among FD-fixed auditors.⁴²

⁴² These correlations are for the overall reliance decisions. Similar results were obtained for the tests of controls and substantive tests decisions, and therefore, were not presented here.

Summary

This study's results show that cognitive style affects auditors' decision processes and that a previously unresearched dimension of cognitive style, mobility-fixity, affects their decision outcomes as well. In addition, a non-self-report technique provided several findings that contradict prior research on the use of factors in the auditor's reliance decision. Consensus among auditors was moderate overall, but within the FI-mobile and FD-mobile groups, consensus was considerably greater. The next chapter discusses this study's conclusions and recommendations for future research.

Chapter 5

CONCLUSIONS AND RECOMMENDATIONS

This final chapter presents conclusions of this research, recommendations for future research, and implications of this research for accounting practice. The chapter is organized into three major sections. The first section discusses the conclusions drawn from the three phases of the research. The second section presents recommendations for future research. The third section presents implications of the research for accounting practice.

Conclusions

The major conclusion of this study is that a relationship exists between auditors' cognitive styles and their decisions and decision processes. This relationship at least partially explains the mixed results in prior studies on the importance of IAF factors and the degree of consensus among auditors making the reliance decision. The following sections present the conclusions that can be drawn from the three phases of research into the role of cognitive style in auditors' reliance decisions: 1) determining auditors' cognitive styles, 2) comparing reliance decisions of auditors with different cognitive styles, and 3) examining auditors' decision processes as they made reliance decisions.

Determining Auditors' Cognitive Styles

Of the 51 auditors who participated in this study, 19 (37%) were categorized as having a field independent-fixed cognitive style, 16 (31%) were categorized as field dependent-fixed, 8 (16%) were categorized as field independent-mobile, and 8 (16%) were categorized as field dependent-mobile. Most auditors in this study (68%) were fixed in their cognitive styles. That is, they always choose the same approach to solving problems. FI-fixed auditors always approach a problem searching for detailed pieces of information to solve it, whereas FD-fixed auditors always take a "big picture" approach to problem solving.⁴³

Mobile auditors, on the other hand, possess some characteristics of both FD and FI cognitive styles. Depending on the circumstances, these auditors vary their problem-solving strategies. FI-mobile auditors normally choose a detailed (i.e., analytic) strategy for solving a problem but can choose a "big picture" (i.e., global) strategy if they feel such a strategy is necessary. FD-mobile auditors normally operate with a global approach to problem solving. That is, they usually try to process information sets in their entirety rather than in pieces, but they can search for detailed pieces of information to solve a problem if they think the solution to the problem requires an analytic approach.

The overall conclusion that can be drawn from the above findings is that auditors differ in the way they organize and process information, and therefore, cannot be labeled a homogeneous group when cognitive processing methods are considered.

⁴³ These statements assume that an individual's problem-solving strategy remains constant across tasks. One could perhaps argue, however, that auditors may use different problem-solving strategies in audit settings than in non-audit settings.

Comparing Reliance Decisions

Three general comparisons of reliance decisions were made for auditors with different cognitive styles. Two industries were also tested for differences. This section discusses these three comparisons and industry tests.

Mobile v. fixed auditors. Prior research in psychology has found that the mobility-fixity dimension of FD/FI significantly affects performance on tasks that require separating out critical pieces of information. This research tested the general hypothesis that mobile and fixed auditors would make significantly different reliance decisions.

The results of the analysis of variance (ANOVA) procedures show that mobile and fixed auditors made significantly different reliance decisions (at the .05 level) for the overall reliance decision. Further analysis showed that this difference was due mainly to the substantive tests decision, where the difference was significant at the .01 level. The auditors did not differ significantly (at the .10 level) in the tests of controls reliance decision. This lack of significant difference may have been due to the fact that hours assigned to tests of controls were only one-third of the total hours in the audit program, so there was less margin for difference between the two groups.

In each decision, mobile auditors assigned more hours to the internal audit function (IAF) than did fixed auditors. Whether this suggests that mobile auditors performed better than fixed auditors on the reliance decisions is difficult to assess. What is apparent from these findings, however, is that mobility-fixity was an important element in the auditors' decisions to rely on internal auditors.

Field-dependent v. field-independent auditors. Accounting researchers who have studied cognitive style in an information systems setting found that field dependence/field independence did not affect accountants' decisions. The one prior study of cognitive style in an auditing setting also found that FD/FI alone did not affect auditors' decisions. Using ANOVA procedures, this study supported the finding of prior accounting researchers.

Field-dependent and field-independent auditors did not make significantly different reliance decisions (at the .10 level). This finding of no significant differences between FD and FI auditors coupled with the highly significant differences found between mobile and fixed auditors suggests that an essential dimension of cognitive style, mobility-fixity, has been ignored by previous accounting and auditing researchers.

Field-independent-fixed auditors v. others. Because of prior research in the psychology literature (Haronian and Sugerman, 1967; Cunningham, et al., 1988) hypothesizing that FI-fixed subjects outperform subjects in the other three cognitive style subtypes (i.e., FI-mobile, FD-fixed, and FD-mobile), this study tested the general hypothesis that FI-fixed auditors would make significantly different reliance decisions from other auditors. FI-fixed auditors' decisions were compared to the other three subtypes combined, and they were compared to each subtype individually. ANOVA results were not significant at the .10 level for any tests of this hypothesis. This finding suggests that FI-fixed auditors alone do not account for the difference cited earlier between mobile and fixed auditors.

What should also be noted is that the results in the Cunningham, et al. [1988] study were not highly significant. In their study, FI-fixed subjects outperformed FD-mobile and FD-fixed subjects on one version of the complex cognitive task they were assigned, but FI-fixed subjects did not perform significantly different from any other subtypes on the other version of the task. Therefore, the results of this research do not differ substantially from the results in the psychology study.

Industry differences. Because Tiessen and Colson [1990] found that auditor reliance differed significantly across industries, this study also tested for differences between auditor reliance decisions in two industries, manufacturing and finance. T-test results showed that a significant difference (at the .05 level) between the manufacturing and finance industry cases existed for the FI-mobile group only. The field-independent-mobile auditors relied more on the internal auditors in the finance industry case than they did in the manufacturing industry case. This result provides only limited support for Tiessen and Colson's finding of industry effects on auditors' reliance decisions.

Examining Auditors' Decision Processes

This study's examination of auditors' decision processes had a two-fold objective:

1) to determine how cognitive style affects the reliance decision process, and 2) to provide an objective analysis of how information related to the internal audit function was processed.

Cognitive style effects on decision process. Prior accounting researchers found that field-dependence/field independence did not affect the reliance decision, but did affect accountants' preference for information. This research tested whether FD/FI affected

auditors' decision processes by affecting which internal audit function factors they used to make the reliance decision.

Information for this test was compiled from the computer tracing program reports generated for each auditor participating in this study. These reports contained the factors that the auditors viewed, the order in which the factors were viewed, and the amount of time that the auditors spent viewing each factor. Five dependent variables were used to test for cognitive style effects on the auditors' decision process. These five variables relate to three layers of factors contained in the data base. The first layer of factors contained the three general factors of competence, objectivity, and work performance. The second layer contained three or four categories of information related to each of the three general factors. Finally, the third layer contained several detailed items of information related to each of the second layer of factors.

Table 19 presents the five variables tested and the conclusions drawn from each test. The first variable tested was the order in which the auditors viewed the first layer of factors, competence, objectivity, and work performance. Fisher's Exact Test did not result in significant differences (at the .10 level) between the orders in which FD and FI auditors viewed these general factors.

The second variable tested was the amount of time that FD and FI auditors spent viewing information related to the first layer of general factors. T-tests were performed on the FD and FI auditors' times for viewing competence, objectivity, and work performance information. The time that FD and FI auditors spent viewing competence information was significantly different at the .05 level. The other two tests (for

objectivity and work performance) were not significantly different at the .10 level. This result provides some support for a cognitive style effect on auditors' decision processes.

In all three tests, field-dependent auditors spent more time than field-independent auditors viewing the information. This finding supports research in the psychology literature that asserts FD subjects use a global processing strategy and FI subjects use an analytic strategy.

Within each of the three layer 1 factors, there were three or four categories of information related to each factor. The orders in which these layer 2 factors were viewed were tested for differences between field-dependent and field-independent auditors using Fisher's Exact Tests for independence. The categories within competence, objectivity, and work performance were tested separately. None of the tests were significant at the .10 level.

The layer 2 categories of information viewed most by FD and FI auditors were also tested for differences using Chi-Square tests for independence. The tests for competence and objectivity categories were significant at the .01 level.

Within the competence factor, FD auditors viewed the internal auditors' experience category most often; and FI auditors viewed the supervision and evaluation of internal auditors category most. Within objectivity, FD auditors viewed the organizational reporting level category most, and FI auditors viewed the independence category most. This finding provides strong evidence in support of a cognitive style effect on the auditors' decision processes.

Finally, within each of these categories, detailed items of information related to the internal audit function were available. Since the auditors had to view this third layer of factors in a single order, the researcher only tested the most often viewed items at this level for differences between FD and FI auditors. Chi-Square tests and Fisher's Exact Test for independence were used to test for cognitive style effects.

Within the four categories of competence factors, field-dependent and field-independent auditors differed significantly (at the .05 level) in their use of factors in three categories, instructions given to internal auditors, experience, and supervision and evaluation. In the instructions category, FD auditors used a factor related to the internal auditors' attendance at an in-house training seminar more often, whereas FI auditors used a factor related to the internal auditors' compliance with the Standards for the Professional Practice of Internal Auditing more often in their reliance decisions.

Within the three categories of objectivity factors, two resulted in significant differences between field-dependent and field-independent auditors. For the independence category, FD auditors considered internal auditors' authority to investigate any aspect of the company's operations as more important to their reliance decision. Field-independent auditors considered whether internal auditors performed duties that conflicted with their internal audit responsibilities as more important to their decision. For the objectivity category, top management support of the internal audit function, FD auditors considered the existence of formal follow-up procedures more important, and FI auditors viewed the internal audit director's control of hiring and firing decisions more important. None of

the tests of work performance factors resulted in significant differences (at the .10 level) between FD and FI auditors.

Overall, the evidence in this study supports a cognitive style effect on auditors' decision processes. The evidence appears strongest, however, in the more detailed information. Tests for differences in the three general factors of competence, objectivity, and work performance resulted in little or no significance. But as the information being tested became more detailed, the differences between FD and FI auditors' choices of factors became more evident.

Importance of factors. Prior studies of auditors' reliance on internal auditors relied on the auditors' self-reporting factors considered most important to their decision. Auditing researchers found, however, that auditors generally have a low degree of self-insight, and therefore, may not be able to accurately determine which factors were most important to the decision. For this reason, Tiessen and Colson [1990] recommended that researchers use non-self-report techniques for gathering data related to the importance of factors in the reliance decision.

This researcher used a computer tracing program as a non-self-report technique for gathering information about the factors important to the reliance decision. In fact, the auditors participating in this study were not aware that the tracing program existed, and therefore, did not know that their decision processes were under investigation.

This objective technique for gathering information provided some results that contradicted prior research on auditor reliance. In most prior studies, work performance or a combination of competence and work performance were considered the most

important factors in the auditor's decision to rely on internal auditors. In this study, however, objectivity was the single most important layer 1 factor for both field-dependent and field-independent auditors.

In addition, the work performance layer 2 factors that were deemed most important in this study, documentation and implementation of findings, were inconsistent with prior research that found adequate scope of internal audits was the most important work performance category. Finally, at the third layer, information regarded as most important in this study did not agree with research reporting a similar level of detail. While EDP experience was most important to FD auditors and experience with the company was most important to this study's FI auditors, prior research found that auditing experience was most important.

An interesting finding was that several factors reported most important by FD auditors in this study were consistent with some prior studies while factors deemed most important by FI auditors in this study coincided with other prior research. Independence, for example, was the most important objectivity factor for field-independent auditors in this study. This finding is consistent with Clark et al. [1980], Brown [1983], and Messier and Schneider [1988]. For this study's field-dependent auditors, however, organizational reporting level was the most important objectivity factor. This finding is consistent with the Abdel-khalik et al. [1983] study.

This finding suggests one explanation for the mixed results found in prior research. Since cognitive style affects auditors' decision processes, it affects the factors that are most important to their reliance decisions. Perhaps the inconsistencies in prior research

related to the importance of factors were due to the auditors' different cognitive styles and not to methodological differences. In addition, the overall consensus among auditors in this study was moderate, but consensus was substantially greater within two of the four cognitive style groups suggesting that cognitive style does in fact affect the degree of consensus among auditors making reliance decisions.

Recommendations for Future Research

This study examined the role of cognitive style in an auditor's decision to rely on internal auditors. This was the first auditing study of the mobility-fixity dimension of FD/FI. Since mobility-fixity was found to be an important determinant of auditors' reliance decisions, additional research into this dimension of cognitive style is needed. Future studies are needed to determine if mobility-fixity can impact other major audit judgments as well as other major reliance decisions.

For example, given increasing concern about fraud detection, perhaps a logical extension would be to replicate Pincus' [1990] study of the relationship between auditors' cognitive styles and fraud detection using mobility-fixity. Recall that Pincus found that FD/FI was an important element of auditors' judgments only when it interacted with another individual difference variable, ambiguity tolerance. An interesting study would replicate Pincus' study and also test auditors on the mobility-fixity dimension of FD/FI. If mobility-fixity had as significant an effect on auditors' fraud detection as it did on

auditors' reliance decisions, "value" could be assigned to mobility v. fixity in auditors. That is, if mobile and fixed auditors made significantly different fraud detection decisions, a determination could be made whether mobile auditors made **better** decisions than fixed auditors. This determination would be an improvement to this study because whether mobile auditors made better reliance decisions than fixed auditors was too difficult to conclude in this research.

Another potential study of the mobility-fixity dimension would be a survey of the cognitive styles of auditors at each level (i.e., staff, senior, manager, etc.) in an accounting firm. Most of the senior managers in this study were mobile. An interesting research question would be whether this mobility characteristic is necessary for promotion to senior manager or whether the experience as senior manager brings about mobility in an auditor. The results of such a study could have interesting implications for practice as discussed in the next section.

This study also examined the effect of FD/FI on the auditor's decision process. An interesting extension of this research would examine the additional effect, if any, that mobility-fixity has on the decision process. Since mobility-fixity had a significant effect on the decision outcome, a similar effect on the decision process would be an interesting finding. Pincus [1990] noted that how cognitive style affects the audit judgment was an important research question. This study raised another related question: how does cognitive style, including the mobility-fixity dimension, affect the audit judgment process?

Finally, this researcher developed a computer tracing program to study auditors' decision processes. This objective data gathering technique proved a useful way to

ascertain the importance of factors to auditors' reliance decisions without relying on their self-report of those factors. This and similar non-self-report techniques should be extended to other accounting and auditing research of decision processes, especially those areas that have relied previously on self-report data gathering techniques.

For example, the use of a tracing program to monitor decision processes could be extended to accounting research of financial statement users' needs. Often accounting researchers attempt to determine what information users need and how they use it by asking them to indicate their preference and use on questionnaires. An interesting study would give financial statement users, for example bank loan officers, a case in which they made a loan decision and a data base from which to choose information for making the decision. A tracing program could monitor the users' search through the data base without the users' knowledge. This program could provide an objective indicator of the information that the user employed in the decision process and how the information was used in the decision.

Implications for Accounting Practice

This research contained several findings that have implications for accounting practice. First, this research showed that auditors' cognitive styles impact their reliance decisions on internal auditors. In an audit environment where balance between efficiency (i.e., not too much reliance) and effectiveness (i.e., enough reliance) must be maintained, accounting firms should be aware of the factors that potentially affect auditors' decisions.

Knowledge of the auditors' cognitive styles could influence the assignment of auditors to particular audit engagements as well as training methods; therefore, firms should be aware of cognitive style differences among auditors.

Second, an auditor's cognitive style can be one element in the firm's overall hiring and promotion process. As discussed in the previous section, a particular cognitive style could be correlated with promotion, and therefore success. If research indicated that mobility, for example, was an indicator of good decision making in audit settings, firms could consider cognitive style in recruiting and promoting to determine whether that person's cognitive style matched the firm's needs. Of course, cognitive style would not be the only determinant in hiring or promotion, but it could be given consideration as one part of the overall process.

Third, accounting firms could use the tracing program developed in this study as part of their auditor training programs. For example, managers and seniors could evaluate the same case, and their tracing program reports could be analyzed for differences. If differences existed, seniors could learn from the managers' reports the information that the managers used and how they used it. Of course, senior managers and partners could also review the information in these reports to assure that the seniors and managers were making the best decisions in the case examples. That is, if the case included some "red flags" that should have been considered in the decision-making process, the auditors' use of this information could be determined from the tracing program reports.

Finally, accounting firms could use tracing programs to evaluate their training programs' effectiveness. If the firm teaches one particular audit approach, a group of

auditors could be given a series of similar cases in which they use this audit approach over a period of several months or years. The tracing program reports from each auditor could be evaluated for changes over time. If an auditor's judgment gets better over time with the use of the particular audit approach, then the firm's training on the approach was appropriate. If the auditor's judgment does not improve or does not change, then perhaps the training on the approach is unclear or inappropriate; and changes could be made to improve the training or modify the audit approach.

In summary, if further research is fruitful, cognitive style could have a significant impact on a firm's assignment of auditors, its training methods, and hiring and promotion practices.

BIBLIOGRAPHY

BIBLIOGRAPHY

American Institute of Certified Public Accountants. Statement on Auditing Standards No. 9: The Effect of an Internal Audit Function on the Scope of the Independent Audit. New York: AICPA, 1975.

———. Statement on Auditing Standards No. 55: Consideration of the Internal Control Structure in a Financial Statement Audit. New York: AICPA, 1988

———. Proposed Statement on Auditing Standards: The Auditor's Consideration of the Internal Audit Function in an Audit of Financial Statements. New York: AICPA, 1990.

———. Statement on Auditing Standards No. 65: The Auditor's Consideration of the Internal Audit Function in an Audit of Financial Statements. New York: AICPA, 1991.

Abdel-Khalik, R., D. Snowball, and J. Wragge. "The Effects of Certain Internal Audit Variables on the Planning of External Audit Programs," The Accounting Review (April, 1983) pp. 215-227.

Barrett, M. J. "Should SAS No. 9 Be Revised?" Internal Auditing (Spring, 1990) pp. 61-68.

Benbasat, I. and A. Dexter. "Value and Events Approaches to Accounting: An Experimental Evaluation," The Accounting Review (October, 1979) pp. 735-749.

———. "Individual Differences in the Use of Decision Support Aids," Journal of Accounting Research (Spring, 1982) pp. 1-11.

Bloomberg, M. "Creativity as Related to Field Independence and Mobility," Journal of Genetic Psychology Vol. 118 (1971) pp. 3-12.

Brown, P. "Independent Auditor Judgment in the Evaluation of Internal Audit Functions," Journal of Accounting Research (Autumn, 1983) pp. 444-455.

Byington, J. and P. Munter. "The Importance of Internal Audit Department Characteristics," Internal Auditing (Summer, 1989) pp. 3-11.

Cantwell, A. "Group Embedded Figures Test," in D. J. Keyser and R. C. Sweetland (Eds.), Test Critiques (1986) Kansas City, MO: Publication Test Corporation of America. Vol. 5, pp. 189-197.

- Carter, H. and R. Loo. "Group Embedded Figures Test: Psychometric Data," Perceptual and Motor Skills Vol. 50 (1980) pp. 32-34.
- Chesley, G. "Subjective Probability Elicitation: The Effect of Congruity of Datum and Response Mode on Performance," Journal of Accounting Research (Spring, 1977) pp. 1-11.
- Clark, H. and K. Roof. "Field Dependence and Strategy Use," Perceptual and Motor Skills Vol. 66 (1988) pp. 303-307.
- Clark, M., T. Gibbs, and R. Schroeder. "CPAs Judge Internal Audit Department Objectivity," Management Accounting (February, 1981) pp. 40-43.
- Cooperman, E. "Field Differentiation and Intelligence," Journal of Psychology Vol 105 (1980) pp. 293-303.
- Cunningham, D., S. Ridley, and A. Campbell. "Performance of Field-Independent and Dependent College Students, and Their "Fixed" and "Mobile" Subtypes, on Two Formats of a Cognitive Task," Perceptual and Motor Skills Vol. 66 (1988) pp. 311-317.
- DeSanctis, G. and R. Dunikoski. "Group Embedded Figures Test: Psychometric Data for a Sample of Business Students," Perceptual and Motor Skills Vol. 56 (1983) pp. 707-710.
- Eisner, D. "Developmental Relationships Between Field Independence and Fixity-Mobility," Perceptual and Motor Skills Vol. 34 (1972) pp. 767-770.
- Gibbs, T. and R. Schroeder. "External Auditor Criteria for Evaluating Internal Audit Departments," The Internal Auditor (December, 1980) pp. 34-42.
- Goldstein, K. and S. Blackman. Cognitive Style (1978) New York, NY: John Wiley and Sons. pp. 2-4.
- Goodenough, D. "The Role of Individual Differences in Field Dependence as a Factor of Learning and Memory," Psychological Bulletin Vol. 83 (1976) pp. 675-694.
- Gul, F. "A Note on the Relationship Between Age, Experience, Cognitive Styles and Accountants' Decision Confidence," Accounting and Business Research (Winter, 1983) pp. 85-88.
- "The Joint and Moderating Role of Personality and Cognitive Style on Decision Making," The Accounting Review (April, 1984) pp. 264-277.

- . "Tolerance for Ambiguity, Auditors' Opinions and Their Effects on Decision Making," Accounting and Business Research (Spring, 1986) pp. 99-105.
- and O. Zaid. "Field Dependence and Accountants' Confidence in Decisions," Psychological Reports Vol. 49 (1981) pp. 949-950.
- Hansson, S., O. Ryden, and P. Johnsson. "Field-Dependence/Independence: Ability in Relation to Mobility-Fixity," Perceptual and Motor Skills Vol. 63 (1986) pp. 279-293.
- Haronian, F. and A. Sugerman. "Fixed and Mobile Field Independence: Review of Studies Relevant to Werner's Dimension," Psychological Reports Vol. 21 (1967) pp. 41-57.
- Hooks, K. and S. Cheramy. "Women's Expanding Role in Public Accounting," Journal of Accountancy Vol. 167 (1989) pp. 66-70.
- Hulfish, S. "Relationship of Role Identification, Self-Esteem, and Intelligence to Sex Differences in Field Independence," Perceptual and Motor Skills Vol. 47 (1978) pp. 835-842.
- Johnson, J. "The Figural Intersections Test (FIT): A Measure of Mental (M) Attentional Energy." Unpublished Manuscript, York University, 1982.
- Levene, H. "Robust Tests for Equality of Variances," In I. Olkin (Ed.), Contributions to Probability and Statistics. (1960) Palo Alto, CA: Stanford University Press. pp. 278-292.
- Lusk, E. "Cognitive Aspects of Annual Reports: Field Independence/Dependence," Journal of Accounting Research Supplement (1973) pp. 191-202.
- . "A Test of Differential Performance Peaking for a Disembedding Task," Journal of Accounting Research (Spring, 1979) pp. 286-294.
- and M. Kersnick. "The Effect of Cognitive Style and Report Format on Task Performance: The MIS Design Consequences," Management Science (August, 1979) pp. 787-798.
- and H. Wright. "Differences in Sex and Curricula on Learning the Group Embedded Figures Test," Perceptual and Motor Skills Vol. 53 (1981) pp. 8-10.
- Margheim, L. "Further Evidence on External Auditors' Reliance on Internal Auditors," Journal of Accounting Research (Spring, 1986) pp. 194-205.

- McCormick, R. "The Balance Effect on the M-space by Spatial Interaction," Alberta Journal of Educational Research (June, 1982) pp. 113-121.
- McRae, L. and J. Young. "Group Embedded Figures Test: Psychometric Data for a Sample of Canadian Undergraduate Business Students," Perceptual and Motor Skills Vol. 67 (1988) pp. 195-198.
- Messier, W. and A. Schneider. "A Hierarchical Approach to the External Auditor's Evaluation of the Internal Auditing Function," Contemporary Accounting Research (Spring, 1988) pp. 337-353.
- Mykityn, P. "Group Embedded Figures Test (GEFT): Individual Differences, Performance, and Learning Effects," Educational and Psychological Measurement Vol. 49 (1989) pp. 951-959.
- Neter, J., W. Wasserman, and M. Kutner. Applied Linear Statistical Models. 2nd ed. Homewood, IL: Irwin; 1985.
- Niaz, M. "Mobility-Fixity Dimension in Witkin's Theory of Field-Dependence/Independence and Its Implications For Problem Solving in Science," Perceptual and Motor Skills Vol. 65 (1987) pp. 755-764.
- and Lawson, A. "Balancing Chemical Equations: The Role of Developmental Level and Mental Capacity," Journal of Research in Science Teaching Vol. 22 (1985) pp. 41-51.
- Nisbett, R. and T. D. Wilson. "Telling More Than We Can Know: Verbal Reports on Mental Processes," Psychological Review Vol. 84 (1977) pp. 231-259.
- O'Connor, K. and G. Blowers. "Cognitive Style, Set and Sorting Strategy," British Journal of Psychology Vol. 71 (1980) pp. 17-22.
- Oltman, P., E. Raskin, and H. Witkin. Group Embedded Figures Test Palo Alto, CA: Consulting Psychologists Press, 1971.
- Pascual-Leone, J. "A Mathematical Model for the Transition Rule in Piaget's Developmental Stages," Acta Psychologica Vol. 32 (1970) pp. 301-345.
- and H. Ijaz. "Mental Capacity Testing as a Form of Intellectual-Developmental Assessment," In R. J. Samuda, et al. (1989), Assessment and Placement of Minority Students Toronto, Ontario, Canada: C. J. Hogrefe and Intercultural Social Sciences Publications. pp. 143-171.

Pincus, K. "Group Embedded Figures Test: Psychometric Data for a Sample of Accountants Compared With Student Norms," Perceptual and Motor Skills Vol. 60 (1985) pp. 707-712.

———— "Auditor Individual Differences and Fairness of Presentation Judgments," Auditing: A Journal of Practice and Theory Vol. 9, No. 3 (1990) pp. 150-166.

SAS Institute Inc., SAS/STAT User's Guide, Version 6, Fourth Edition, Volume 1, Cary, NC: SAS Institute Inc., 1989, p. 23.

Schneider, A. "Modeling External Auditors' Evaluations of Internal Auditing," Journal of Accounting Research (Autumn, 1984) pp. 657-678.

———— "The Reliance of External Auditors on the Internal Audit Function," Journal of Accounting Research (Autumn, 1985) pp. 911-919.

Tiessen, P. and R. Colson. "External Auditor Reliance on Internal Audit," Internal Auditing (Winter, 1990) pp. 10-22.

Ward, D. and J. Robertson "Reliance on Internal Auditors: Can Independent Auditors Use More Extensively the Work of Their Internal Counterparts?" Journal of Accountancy (October, 1980) pp. 62-73.

Werner, H. "The Concept of Development From a Comparative and Organismic Point of View," In D. B. Harris (Ed.), The Concept of Development: An Issue in the Study of Human Behavior. (1957) Minneapolis, MN: University of Minnesota Press. pp. 125-148.

Witkin, H. "Individual Differences in Ease of Perception of Embedded Figures," Journal of Personality Vol. 19 (1950) pp. 1-15.

———— "Psychological Differentiation and Forms of Pathology," Journal of Abnormal Psychology Vol. 70 (1965) pp. 317-336.

————, P. Oltman, E. Raskin, and S. Karp. A manual for the Embedded Figures Test. Palo Alto, CA: Consulting Psychologists Press, 1971.

———— "Role of the Field-Dependent and Field-Independent Cognitive Styles in Academic Evolution: A Longitudinal Study," Journal of Educational Psychology Vol. 69 (1977) pp. 197-211.

———— and D. Goodenough. "Field Dependence and Interpersonal Behavior," Psychological Bulletin Vol. 84 (1977) pp. 661-689.

_____, C. Moore, D. Goodenough, and P. Cox. "Field Dependent and Field Independent Cognitive Styles and Their Educational Implications," Review of Educational Research Vol. 47 (1977) pp. 1-64.

APPENDICES

Appendix A: Tables

Table 1

Studies of Auditors' Reliance on Internal Auditors

<u>Author(s)</u>	<u>Objective of Study</u>	<u>Methodology</u>	<u>Findings</u>
<i>Auditors' Reliance on Internal Auditor in Internal Control Structure Evaluation</i>			
Ward & Robertson [1980]	Determine if auditors (EAs) rely on internal auditors (IAs)	Surveyed EAs and IAs	EAs rely on internal auditors
Gibbs & Schroeder [1980]	Develop list of criteria that EAs use to evaluate IAs	Surveyed EAs and IAs to collect criteria; Used Delphi Process to separate criteria into SAS No. 9 categories	11 criteria identified with competence, 9 with objectivity, and 12 with work performance
Clark, Gibbs, & Schroeder [1981]	Examine degree of variability in EA's judgment of IA	Cases given to 25 partners and managers of Big Eight firm; Task was to evaluate IA objectivity on 4-point scale; ANOVA used to test for lack of consensus in judgment	Lack of consensus in EAs' judgments of objectivity. Independence of IA most important factor for one group; Adequate scope of audits most important for another group
Abdel-khalik, Snowball, and Wragge [1983]	Test effect of 3 EDP audit techniques used by IA and 2 objectivity variables on EAs' reliance decision, hours planned for compliance testing and hours planned for substantive testing	Conducted experiments with seniors and managers; Accounts receivable and accounts payable used as experimental setting; ANOVA and MANOVA used	Org. level to which IA reports is most important factor; EDP audit techniques of equal importance; EAs were consistent over time, but low consensus except for agreement on importance of level to which IA reports
Brown [1983]	Find important factors EAs use and determine whether factors were used consistently	Cases given to seniors and managers from 4 Big Eight firms; Task was to evaluate competence, objectivity, and work performance and provide overall reliance decision on 7-point scale	IA independence and prior year's work most important factors; High consensus among EAs, and used factors consistently; low self-insight
Schneider [1984]	Model EA reliance decision in revenue cycle	Used conjoint measurement to develop model; Given cases, EAs evaluated IA strength on model; work 100-point scale	EAs follow additive performance most important factor; High degree of consensus

Table 1
(continued)

Schneider [1985]	Examine relationship between evaluation of IA and extent of reliance placed on IA in revenue cycle	Evaluated strength of 16 profiles of IA department; Provided reliance judgment (% reduction in audit hours) for same 16 profiles; Reliance judgments correlated with evaluation judgments to determine consistency between them	EAs were consistent in assigning fewer (more) audit hours to IA departments judged stronger (weaker); Consensus high when IA weak but low when IA strong
Margheim [1986]	Examine reliance decision (budgeted audit hours) in accounts receivable area	Combined competence and work performance into one factor; Two levels of each factor resulted in 4 cases plus 1 control case; Task was to budget audit hours for tests of controls and substantive tests. MANOVA and ANOVA used	Significant differences between control case and high comp/work cases but no sig. differences between control and low comp/work cases regardless of objectivity level
Messier & Schneider [1988]	Examine overall reliance decision to determine most important factors	Used Analytic Hierarchy Process to develop 3 levels of attributes used in decision; Conducted experiments with supervisors and managers; task was to make pairwise comparisons of each level of factors	Comp. most important; obj. second; work third; IA experience most important comp. attribute; IA indep. most imp. obj. attribute; scope of IA audits most imp. work attribute; Inconsistency in level 2 comparisons; Contradicts previous research that found work most important
Byington & Munter [1989]	Examine overall reliance decision	Surveyed partners & managers; Gave 64 cases; task was to indicate extent of reliance on 100-point scale	Average reliance scores are presented as a measurement tool for both EAs and client org.

Cognitive Processes of Auditors Making Reliance Decision

Tiessen & Colson [1990]	Determine if EAs can accurately self-report point scale variables considered in decision and if client industry affects decision	Surveyed EAs and IA directors; EAs indicated on 5-point scale 12 criteria had on decision; most imp. also reported actual reliance decision; IA directors gave data on comp, obj, and work of IA dept; Used actual clients rather than hypothetical data	EAs report work factor; Data collected from IA indicates working relationship between EA and IA most important; Only 1 obj. and 0 comp variables assoc. with reliance; EAs have low self-insight; Decisions differed sig. across 9 industries
-------------------------	--	--	---

Table 2
Current Position of Subjects

	Total	(%)	PW	(%)	KPMG	(%)
Senior Manager*	6	(11.8)	4	(33.3)	2	(5.1)
Manager	6	(11.8)	5	(41.7)	1	(2.6)
Senior	23	(45.1)	3	(25.0)	20	(51.3)
Staff	14	(27.5)	0	(0.0)	14	(35.9)
Unreported	2	(3.8)	0	(0.0)	2	(5.1)
Totals	51	(100%)	12	(100%)	39	(100%)

* This category includes one partner who participated in the study.

Table 3

Mean Years of Experience of Subjects by Position
(Standard deviation shown in parentheses)

	Total	PW	KPMG
In current position:			
Senior Manager	1.42 (1.24)	1.75 (1.44)	.75 (0.35)
Manager	1.17 (0.61)	1.20 (0.67)	1.00 (0.00)
Senior	1.47 (0.92)	2.67 (0.29)	1.29 (0.85)
Staff	.80 (0.56)	N/A	.80 (0.56)
In public accounting:			
Senior Manager	10.33 (2.25)	10.75 (1.89)	9.50 (3.54)
Manager	6.38 (0.49)	6.45 (0.51)	6.00 (0.00)
Senior	3.62 (1.24)	5.67 (0.29)	3.31 (1.01)
Staff	1.46 (0.46)	N/A	1.46 (0.46)
Making reliance decisions:			
Senior Manager	6.17 (0.93)	6.38 (1.11)	5.75 (0.35)
Manager	4.17 (0.75)	4.00 (0.71)	5.00 (0.00)
Senior	1.72 (1.27)	3.17 (1.15)	1.50 (1.16)
Staff	.31 (0.31)	N/A	.31 (0.31)

Table 4

Highest Degree and Certificates Held
(n=49)*

	Total (%)	PW (%)	KPMG (%)
<u>Degree</u>			
Bachelors:			
Senior Manager	6 (14.6)	4 (40.0)	2 (6.5)
Manager	4 (9.8)	3 (30.0)	1 (3.2)
Senior	20 (48.8)	3 (30.0)	17 (54.8)
Staff	11 (26.8)	NA --	11 (35.5)
Totals	41 (100%)	10 (100%)	31 (100%)
Masters:			
Senior Manager	0 (0.0)	0 (0.0)	0 (0.0)
Manager	2 (25.0)	2 (100.0)	0 (0.0)
Senior	3 (37.5)	0 (0.0)	3 (50.0)
Staff	3 (37.5)	NA --	3 (50.0)
Totals	8 (100%)	2 (100%)	6 (100%)
<u>CPA Certificate</u>			
Senior Manager	6 (15.0)	4 (33.3)	2 (7.1)
Manager	6 (15.0)	5 (41.7)	1 (3.6)
Senior	22 (55.0)	3 (25.0)	19 (67.9)
Staff	6 (15.0)	NA --	6 (21.4)
Totals	40 (100%)	12 (100%)	28 (100%)

* Demographic data were not available for two participants.

Table 5
Gender of Subjects

	Total	(%)	PW	(%)	KPMG	(%)
Gender:						
Male	35	(68.6)	10	(83.3)	25	(64.1)
Female	14	(27.5)	2	(16.7)	12	(30.8)
Unreported	2	(3.9)	0	(0.0)	2	(5.1)
Totals	<u>51</u>	<u>(100%)</u>	<u>12</u>	<u>(100%)</u>	<u>39</u>	<u>(100%)</u>
 Gender by position:						
Senior Manager						
Male	6	(11.8)	4	(33.3)	2	(5.1)
Female	0	(0.0)	0	(0.0)	0	(0.0)
Manager						
Male	5	(9.8)	4	(33.3)	1	(2.6)
Female	1	(2.0)	1	(8.3)	0	(0.0)
Senior						
Male	15	(29.4)	2	(16.8)	13	(33.3)
Female	8	(15.7)	1	(8.3)	7	(17.9)
Staff						
Male	9	(17.6)	NA	—	9	(23.1)
Female	5	(9.8)	NA	—	5	(12.8)
Unreported	2	(3.9)	0	(0.0)	2	(5.1)
Totals	<u>51</u>	<u>(100%)</u>	<u>12</u>	<u>(100%)</u>	<u>39</u>	<u>(100%)</u>

Table 6

Mean Age of Subjects
(Standard Deviation shown in Parentheses)

	Total	PW	KPMG
Mean age by gender:			
Male	27.14 (3.47)	29.90 (2.92)	26.04 (3.08)
Female	25.29 (1.73)	27.00 (0.00)	25.00 (1.71)
Mean age by position:			
Senior Manager	32.83 (3.06)	32.75 (2.22)	33.00 (5.66)
Manager	28.83 (1.33)	28.40 (.89)	31.00 (0.00)
Senior	25.43 (1.16)	26.67 (.58)	25.25 (1.12)
Staff	24.93 (2.23)	N/A	24.93 (2.23)
Mean age of entire sample	26.61 (3.17)	29.42 (2.87)	25.70 (2.73)

Table 7
Formation of Cognitive Style Groups
 (n=51)

GEFT Score Distribution:

FIT Score Distribution:

0 - 0
 1 - 0
 2 - 1
 3 - 2
 4 - 2
 5 - 0
 6 - 1
 7 - 3
 8 - 2
 9 - 1
 10 - 4
 11 - 2
 12 - 4
 13 - 2
 14 - 4
 15 - 6
 16 - 6
 17 - 5
 18 - 6

0 - 0
 1 - 0
 2 - 0
 3 - 0
 4 - 0
 5 - 2
 6 - 1
 7 - 4
 8 - 3
 9 - 2
 10 - 2
 11 - 0
 12 - 4
 13 - 4
 14 - 2
 15 - 5
 16 - 7
 17 - 2
 18 - 5
 19 - 7
 20 - 1

Median: 14
 Mean: 12.53
 Standard Deviation: 4.59

Median: 15
 Mean: 13.69
 Standard Deviation: 4.40

	Fixed	Mobile	Totals
Field-Independent	19 (37%)	8 (16%)	27 (53%)
Field-Dependent	16 (31%)	8 (16%)	24 (47%)
Totals	35 (68%)	16 (32%)	51 (100%)

Table 8
Current Position of Cognitive Style Groups

	FI-Fixed			FI-Mobile			FD-Fixed			FD-Mobile			Total
	No.	(%) ⁺	% ⁻	No.	(%)	%	No.	(%)	%	No.	(%)	%	
Sr. Manager	1	(5.3)	17	2	(28.6)	33	1	(6.7)	17	2	(25.0)	33	6
Manager	2	(10.5)	33	0	(0.0)	0	3	(20.0)	50	1	(12.5)	17	6
Senior	10	(52.6)	43	3	(42.9)	13	7	(46.7)	30	3	(37.5)	13	23
Staff	6	(31.6)	43	2	(28.5)	14	4	(26.6)	29	2	(25.0)	14	14
Totals	19	(100%)		7 [*]	(100%)		15 [*]	(100%)		8	(100%)		49

⁺ Percentages in parentheses are of group (column) totals.

⁻ Percentages shown with no parentheses are of position (row) totals.

* Although 8 (16) auditors were classified as FI-Mobile (FD-Fixed), demographic data were not available for 1 auditor.

Table 9
Gender, Degree, and Experience
of Cognitive Style Groups

	FI-Fixed			FI-Mobile			FD-Fixed			FD-Mobile			Total
	No.	(%) ⁺	% ⁻	No.	(%)	%	No.	(%)	%	No.	(%)	%	No.
Gender:													
Male	14	(74)	40	5	(71)	14	10	(67)	29	6	(75)	17	35
Female	5	(26)	36	2	(29)	14	5	(33)	36	2	(25)	14	14
Totals	19	(100%)		7*	(100%)		15*	(100%)		8	(100%)		49
Highest Degree:													
Bachelors	15	(79)	37	5	(71)	12	13	(87)	32	8	(100)	20	41
Masters	4	(21)	50	2	(29)	25	2	(13)	25	0	(0)	0	8
Totals	19	(100%)		7*	(100%)		15*	(100%)		8	(100%)		49
Average Years of Public Acct Experience:	3.5			5.2			4.4			4.2			4.1

⁺ Percentages in parentheses are of group (column) totals.

⁻ Percentages shown with no parentheses are of gender/degree (row) totals.

* Although 8 (16) auditors were classified as FI-Mobile (FD-Fixed), demographic data were not available for 1 auditor.

Table 10

Manufacturing v. Finance Industries
(Mean hours of reliance shown in parentheses)

	FI-Fixed	FI-Mobile	FD-Fixed	FD-Mobile
	<u>t-statistic*</u>	<u>t-statistic</u>	<u>t-statistic*</u>	<u>t-statistic*</u>
Overall	-0.16 (p=.8722) (37.8 M 36.1 F)	2.67 (p=.0368) (41.7 M 76.5 F)	-0.07 (p=.9476) (31.1 M 30.2 F)	-1.04 (p=.3363) (51.4 M 40.0 F)
Tests of Controls	1.02 (p=.3240) (11.3 M 15.8 F)	1.06 (p=.3300) (15.0 M 21.5 F)	.32 (p=.7538) (11.8 M 13.2 F)	-1.48 (p=.1901) (14.4 M 8.0 F)
Substantive Tests	-0.88 (p=.3916) (26.5 M 20.3 F)	3.07 (p=.0220) (26.7 M 55.0 F)	-0.23 (p=.8183) (19.3 M 17.0 F)	-0.46 (p=.6646) (37.0 M 32.0 F)

* Negative t-values indicate that the manufacturing industry case was assigned more hours than the finance industry case.

M = Manufacturing industry case

F = Finance industry case

Table 11
Mobile v. Fixed Auditors

	<u>R-Square</u>	<u>F-statistic</u>	Mean Reduction in hours	
			<u>Mobile</u>	<u>Fixed</u>
Overall	.108	5.02 (p=.0298)	48.75	33.91
Tests of Controls	.034	.39 (p=.5353)	14.31	12.72
Substantive Tests	.145	7.22 (p=.0099)	34.44	21.19

Table 12

Field-Dependent v. Field-Independent Auditors

	<u>F-statistic</u>	Mean Reduction (in hours)	
		<u>FD</u>	<u>FI</u>
Overall	.53 (p=.4705)	38.92	43.74
Tests of Controls	1.16 (p=.2863)	12.14	14.89
Substantive Tests	.18 (p=.6769)	26.78	28.85

Table 13

Field-Independent-Fixed Auditors v. Others

	FI-fixed v. all others	FI-fixed v. FI-mobile	FI-fixed v. FD-fixed	FI-fixed v. FD-mobile
	<u>F-statistic</u>	<u>F-statistic</u>	<u>F-statistic</u>	<u>F-statistic</u>
Overall	.76 (p=.3888)	2.06 (p=.1575)	.74 (p=.3948)	1.18 (p=.2836)
Tests of Controls	.04 (p=.8490)	.95 (p=.3348)	.09 (p=.7609)	.11 (p=.7463)
Substantive Tests	1.14 (p=.2904)	2.03 (p=.1606)	.99 (p=.3247)	2.64 (p=.1108)

Table 14

Field-Dependent v. Field-Independent Auditors'
Use of Factors in Forming Reliance Decision
 (Order of layer 1 factors)

<u>Orders Tested*</u>	<u>Frequency of Order⁺</u>	<u>Fisher's Exact Test p-value</u>
Obj, Cmp, Wrk	10 FD 13 FI	.306
Cmp, Obj, Wrk	4 FD 8 FI	
All other orders	10 FD 6 FI	

* Obj = Objectivity
 Cmp = Competence
 Wrk = Work Performance

⁺ FD = Field-Dependent auditors
 FI = Field-Independent auditors

Table 15

Field-Dependent v. Field-Independent Auditors'
Use of Factors in Forming Reliance Decision
 (Viewing time of layer 1 factors)

	Mean Viewing Time (in minutes)		
	<u>t-statistic</u>	<u>Field-Dependent</u>	<u>Field-Independent</u>
Competence	2.275 (p=.0273)	8.29	3.59
Objectivity	1.550 (p=.1276)	4.51	2.99
Work Performance	1.503 (p=.1393)	4.56	2.83

Table 16

Field-Dependent v. Field-Independent Auditors'
Use of Factors in Forming Reliance Decision
 (Order of layer 2 factors)
 (Percentages shown in parentheses)

<u>Orders Tested*</u>	<u>Frequency of Order⁺</u>	<u>Fisher's Exact Test</u> <u>p-value</u>
Competence:		
1) Qual, Inst, Exp, Sup & Eval	5 FD (22.7) 10 FI (38.5)	.523
2) Sup & Eval, Exp Inst, Qual	4 FD (18.2) 3 FI (11.5)	
Objectivity:		
1) Org Rept Level, Ind, Top Mgt Supp	9 FD (39.1) 7 FI (28.0)	.130
2) Top Mgt Supp, Ind, Org Rept Level	4 FD (17.4) 1 FI (4.0)	
Work Performance:		
1) Scope, Super, Doc Implement	6 FD (31.6) 10 FI (40.0)	.689
2) Implement, Doc, Super, Scope	3 FD (15.8) 2 FI (8.0)	

* Competence: Qualifications, Instructions, Experience, Supervision and Evaluation
 Objectivity: Organizational Reporting Level, Independence, Top Management Support
 Work Performance: Scope of Audits, Supervision, Documentation, Implementation of findings

⁺ FD = Field-Dependent auditors
 FI = Field-Independent auditors

⁻ Although there were 24 (27) FD (FI) auditors, only 22 (26) viewed competence information, so the percentages are of 22 (26) auditors; 23 (25) FD (FI) auditors viewed objectivity information, and 19 (25) FD (FI) auditors viewed work performance information.

Table 17

Field-Dependent v. Field-Independent Auditors'
Use of Factors in Forming Reliance Decision
 (Most viewed layer 2 factors)
 (Percentages shown in parentheses)

<u>Layer 2 Factors</u>	<u>Frequency of Viewing⁺</u>	<u>Chi-Square Value</u>
Competence:		
1) Supervision & Evaluation	12 FD (25.5) 10 FI (27.8)	7.893 (p=.019)
2) Experience	13 FD (27.7) 9 FI (25.0)	
Objectivity:		
1) Organizational Reporting Level	9 FD (36.0) 15 FI (31.3)	12.826 (p=.002)
2) Independence	7 FD (28.0) 20 FI (41.7)	
Work Performance:		
1) Implementation of findings	11 FD (28.9) 13 FI (25.5)	.425 (p=.515)
2) Documentation	8 FD (21.1) 14 FI (27.5)	

⁺ FD = Field-Dependent auditors
 FI = Field-Independent auditors

⁻ Percentages are of the total number of viewings of all layer 2 factors within each layer 1 factor (competence - 47 viewings for FD auditors, 36 for FI; objectivity - 25 for FD, 48 for FI; work performance - 38 for FD, 51 for FI).

Table 18

Field-Dependent v. Field-Independent Auditors'
Use of Factors in Forming Reliance Decision
 (Most viewed layer 3 factors)
 (Percentages shown in parentheses)

<u>Layer 3 Factors</u>	<u>Frequency of Viewing⁺</u>	<u>Chi-Square Value or Fisher's p-value</u>
<u>Competence</u>		
Instructions:		
1) Seminar	11 FD/6 FI (44.0)/(21.4)	6.071
2) Compliance	10 FD/13 FI (40.0)/(46.4)	(p=.048)
Experience:		
1) EDP	13 FD/7 FI (50.0)/(24.1)	7.326
2) Company	9 FD/16 FI (34.6)/(55.2)	(p=.026)
Super & Eval:		
1) Assignment*	8 FD/3 FI (32.0)/(11.5)	p=.051
2) Instruction	7 FD/11 FI (28.0)/(42.3)	
3) Review*	3 FD/8 FI (12.0)/(30.8)	
<u>Objectivity</u>		
Independence:		
1) Conflicting Responsibilities	13 FD/17 FI (56.5)/(54.8)	6.924
2) Relatives in Audit Sensitive Positions*	5 FD/10 FI (21.7)/(32.3)	(p=.031)
Top Mgt Support:		
1) Hiring/Firing*	4 FD/18 FI (16.7)/(72.0)	6.684
2) Follow-up Procedures	14 FD/6 FI (58.3)/(24.0)	(p=.035)

* SAS No. 65 factors

⁺ FD = Field-Dependent auditors
 FI = Field-Independent auditors

⁻ Percentages are of the total number of viewings of all layer 3 factors within each layer 2 factor
 (Instructions - 25 for FD, 28 for FI; Experience - 26 for FD, 29 for FI; Super & Eval - 25 for FD, 26
 for FI; Independence - 23 for FD, 31 for FI; Top Mgt Support - 24 for FD, 25 for FI).

Table 19
**Cognitive Style Effects
on Decision Process**

Variable Tested	Conclusion
1) Order of layer 1 factors	No significant effect
2) Viewing time of layer 1 factors	Significant effect (at .05) for competence factors
3) Order of layer 2 factors	No significant effect
4) Most viewed layer 2 factors	Significant effect (at .01) for competence and objectivity factors
5) Most viewed layer 3 factors	Significant effect (at .05) for 3 competence factors (instructions to internal auditors, experience, and supervision and evaluation) and 2 objectivity factors (independence and top management support)

Appendix B: Manufacturing Industry Materials

Case Analysis Instructions
(Manufacturing case)

The following instructions were read aloud by the researcher before participants completed the case analysis section of the experiment.

You have been given a brief description of a hypothetical client's internal audit function, a data base of information related to that internal audit function, and an audit program of accounts payable. Please read the description and audit program before searching through the data base.

Notice that the audit program contains two columns, one labeled "Planned Hours Without IA," which contains numbers for each audit step, and one labeled "Planned Hours With IA," which is blank. You should assume that the hours in the first column are your planned audit hours assuming that no internal audit department exists. After viewing the information provided about the client's internal audit function, decide whether you plan to place any reliance on the function, and if so, how much. Indicate this reliance by revising **your** planned audit hours for each step. The numbers you put in the second column should be the hours you and your staff plan to spend on each audit step.

If you have any questions as you work through the case, please let me know.

Background Information
(Manufacturing case)

Your firm has just accepted Major Manufacturing Company as a new client. Major Manufacturing, a producer of a variety of small household appliances, has been in business for 10 years and has obtained a competitive position in the appliance market. You have been involved with similar clients in the past and, therefore, have been put in charge of this audit.

The company's internal audit department employs 25 personnel -- a director, 4 managers, 5 senior auditors, and 15 staff auditors. Preliminary evaluation has concluded that there are internal audit activities relevant to the financial statement audit and that it is cost efficient to consider the internal auditor's work. Your task is to decide whether you will rely on the internal audit function's work, use them as direct assistants, or both in the audit of accounts payable.

The attached audit program has been designed without considering the company's internal audit function. A data base of information about the internal audit function has been provided for you, and you can use any of this information in making your decision. If you decide after reviewing the information to place no reliance on the internal audit function, please indicate this decision by making no adjustments to the attached audit program. If you decide, however, to place some reliance on the internal audit function, indicate the degree of reliance by adjusting the planned audit hours in the appropriate column.

Audit Program for Accounts Payable

	Planned Hours without IA	Planned Hours with IA
--	-----------------------------	--------------------------

Tests of Controls for Accounts Payable System

1. Separation of duties: Includes separation of purchasing from receiving and accounts payable from custody of signed checks

5

2. Purchasing and Receiving Procedures:

Determine if company policies and procedures are being followed in each of these areas: 1) approval of purchases at the proper level (Examine supporting documentation for indication of approval.); 2) use of prenumbered purchase orders and receiving reports (Trace a sequence of purchase orders to receiving reports and receiving reports to purchases journal.); 3) cancellation of purchase orders, receiving reports, and vendors' invoices to prevent their reuse (Examine supporting documentation for indication of cancellation.)

10

3. Procedures for recognizing the liability:

Determine if company procedures exist and are followed for recording transactions as soon as possible after goods are received. (Compare dates of receiving reports and vendors' invoices with dates in purchases journal.)

4

4. Cash disbursement procedures:

Determine if: 1) prenumbered checks are used and accounted for (Reconcile recorded cash disbursements with cash disbursements on bank statement.); 2) a bank reconciliation is prepared monthly by a person independent of recording cash disbursements or custody of checks (Examine bank reconciliations and observe their preparation.); 3) an authorized person examines supporting documentation and approves payment (Examine canceled check and supporting documentation for authorized signature.); 4) procedures require recording transactions as soon as possible after checks are signed (Compare dates on canceled checks with cash disbursements journal.)

12

Substantive Tests for Accounts Payable

Planned Hours without IA	Planned Hours with IA
-----------------------------	--------------------------

1. Review of year-end cutoff:

- 1) Compare receiving reports dated before year-end with documentation for payments made in subsequent period.
- 2) Trace receiving reports dated before year-end to related vendors' invoices.
- 3) Test for inventory in transit by examining vendors' invoices for shipping terms and dates.
- 4) Coordinate cutoff tests with physical observation of inventory.

30

2. Confirmation of accounts payable:

Confirm all large accounts, accounts with debit balances, and accounts with zero balances. Sample other accounts and reconcile all confirmations to the accounts payable list.

10

3. Determination of valuation and mechanical accuracy of accounts payable:

Foot the accounts payable list and trace the total to the general ledger. Reconcile vendor statements to accounts payable list. Select a sample of accounts and agree details to supporting documentation (e.g., purchase orders, receiving reports, vendor invoices, canceled checks, if paid).

20

Appendix C: Finance Industry Materials

Case Analysis Instructions
(Finance case)

The following instructions were read aloud by the researcher before participants completed the case analysis section of the experiment.

You have been given a brief description of a hypothetical client's internal audit function, a data base of information related to that internal audit function, and an audit program of deposit activities. Please read the description and audit program before searching through the data base.

Notice that the audit program contains two columns, one labeled "Planned Hours Without IA," which contains numbers for each audit step, and one labeled "Planned Hours With IA," which is blank. You should assume that the hours in the first column are your planned audit hours assuming that no internal audit department exists. After viewing the information provided about the client's internal audit function, decide whether you plan to place any reliance on the function, and if so, how much. Indicate this reliance by revising **your** planned audit hours for each step. The numbers you put in the second column should be the hours you and your staff plan to spend on each audit step.

If you have any questions as you work through the case, please let me know.

Background Information
(Finance case)

Your firm has just accepted Community Bank as a new client. Community Bank is a well established regional institution with branch offices in several cities. You have been involved with similar clients in the past, and therefore, have been put in charge of this audit.

The company's internal audit department employs 25 personnel--a director, 4 managers, 5 senior auditors, and 15 staff auditors. Preliminary evaluation has concluded that there are internal audit activities relevant to the financial statement audit and that it is cost efficient to consider the internal auditors' work. Your task is to decide whether you will rely on the internal auditors' work, use them as direct assistants, or both in the audit of deposit activities.

The attached audit program has been designed without considering the company's internal auditors. A data base of information about the internal audit function has been provided for you, and you can use any of this information in making your decision. If you decide after reviewing the information to place no reliance on the internal auditors, please indicate this decision by making no adjustments to the attached audit program. If you decide, however, to place some reliance on the internal audit function, indicate the degree of reliance by adjusting the planned audit hours in the appropriate column.

Audit Program for Deposit Activities

Planned Hours without IA	Planned Hours with IA
-----------------------------	--------------------------

Tests of Controls for Deposit Activities

1. Existence of bank policy and monitoring system for deposit accounts: Determine if: 1) procedures are in effect to check the conformity of the terms of accounts with statutory and regulatory requirements; 2) written policy and operational guidelines have been established and are being followed with respect to the types of accounts offered, the service charges and interest rates, interest accrual procedures, and teller check cashing or withdrawal procedures; 3) policies exist for large dollar priority processing, customized accounts, and return items to and from other institutions; 4) periodic credit reviews are performed and documented on major funds transfer customers.

7

2. Procedures to ensure that transactions are recorded in accordance with GAAP:
Determine if policies exist and are being followed in these areas: 1) receipts provided to customers for deposits and other adjustments to deposit accounts; 2) approval required for withdrawals over a specified amount, checks not processed within a 24-hour period, terminal access, open items, correcting entries, and back-value adjustments; 3) cancellation of paid checks and withdrawal tickets and limited access to processed withdrawal tickets; 4) segregation of receipt, data entry, and authentication functions; 5) signature cards prenumbered, controlled by employees other than tellers, physically safeguarded, and compared to withdrawal signatures; 6) limits placed on the number and amount of withdrawals from automatic teller machines (ATMs); 7) control totals established for checks being processed; 8) cutoff procedures in effect to monitor and reduce float and to ensure proper recording in the general ledger of work processed each day.

10

3. Procedures to ensure completeness and accuracy of recorded interest expense and fees:
Determine if: 1) interest rate and fee schedules are maintained and periodically updated; 2) limit checks and other machine controls are used when interest is calculated by computer; 3) fee reports and interest expense reports are periodically produced and reviewed by management.

4

Planned Hours without IA	Planned Hours with IA
-----------------------------	--------------------------

4. Procedures for recognizing deposit liabilities:

- 1) Statements are mailed to customers at the end of each month.
- 2) Employees not involved in the processing of transactions file checks and deposit slips used in preparing and mailing statements.

2

5. Procedures for safeguarding customer funds and bank records from misappropriation or misuse:

- 1) When change of address on an account is required, authorization forms are reviewed and approved by an employee other than a teller; 2) Proof machine operators are prohibited from preparing customer statements; 3) Procedures exist to safeguard checks and other records while in process or in transit; 4) Access to the funds transfer area and user files is restricted to authorized personnel; 5) Access to terminals is controlled by passwords, which are changed frequently; 6) Procedures exist to monitor and control access to ATMs (e.g., machine captures card if wrong PIN is used consecutively; reports are provided to management if an individual customer uses the ATM excessively relative to that customer's past history; PINs mailed separately from cards, and different bank personnel have custody of cards and PINs.

9

6. Detective controls:

- 1) The total of all deposit account transactions is agreed to updates of deposit master files daily, and the master files are reconciled to the general ledger daily; 2) Each teller's cash balance is checked daily against an independent control, and the teller prepares and signs a daily proof sheet, which is reviewed by management; 3) Each ATM total and branch total is proved by central computer processing; 4) Customer inquiries are promptly serviced by employees independent of record keeping, and a log is maintained noting date received, date resolved, and name of investigator; 5) Control tapes are reconciled with the day's cash transactions and reviewed for unusual items.

6

Substantive Tests for Deposit Accounts

Planned Hours without IA	Planned Hours with IA
-----------------------------	--------------------------

1. Review of year-end cutoff:

1) Vouch and verify proper handling of returned items for a period subsequent to the balance sheet date. 2) Review holdover deposit transactions and balance to general ledger holdover accounts. 3) Examine outstanding official checks as of year-end and agree balances to general ledger control accounts. 4) Review significant checks cleared subsequent to year-end. 5) Review significant stale items, as well as any reconciling items for propriety.

25

2. Confirmation of deposit liabilities:

1) Confirm with customers the amount, rate, and terms, including the date interest has been paid, of deposit liabilities. 2) Agree individual confirmation balances to the detail trial balance. 3) If significant reconciling items exist, determine the appropriateness of their subsequent disposition. 4) Perform alternative procedures for all nonresponding positive confirmations and undeliverable confirmations. 5) Clear all exceptions and prepare a confirmation summary. 6) Confirm closed accounts with former customers.

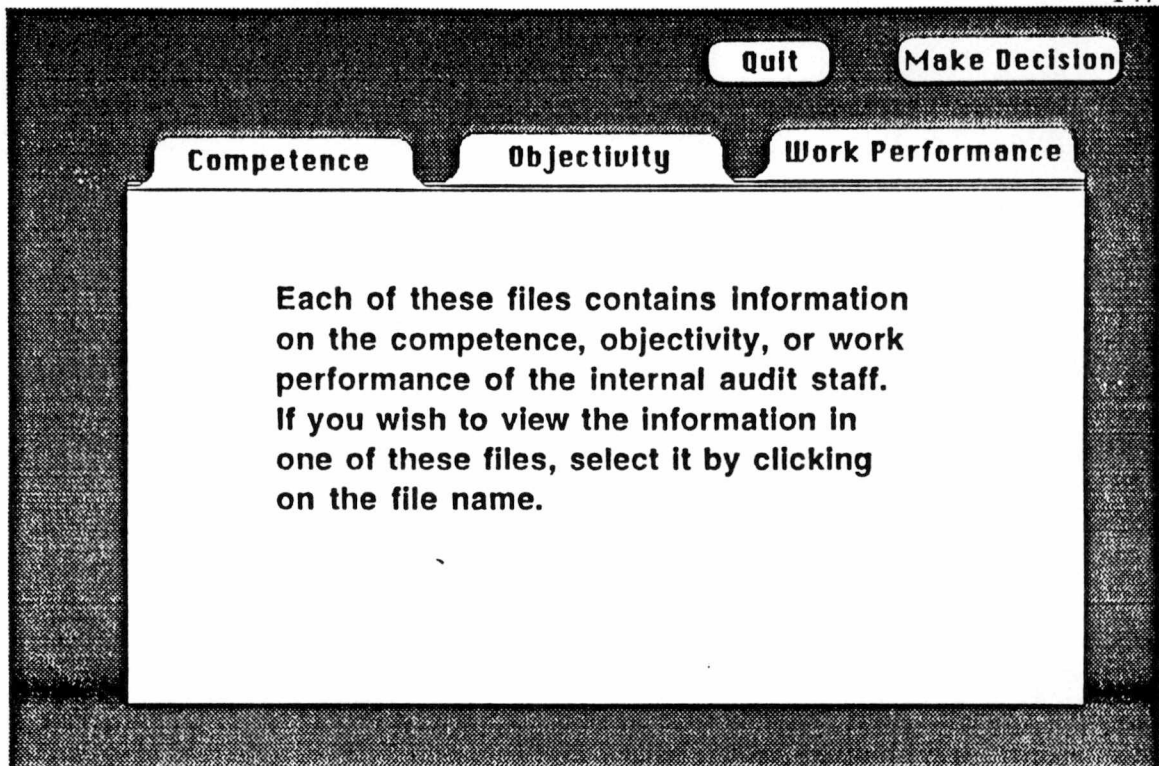
30

3. Determination of valuation and mechanical accuracy of deposit liabilities:

1) Obtain and check mathematical accuracy of deposit liabilities and related accounts. 2) Reconcile ending balances to the trial balance, general ledger, and subsidiary records; and determine the propriety of significant reconciling items. 3) Verify the computation and accounting for accrued interest by checking that each accrual corresponds to a recorded deposit liability and that each interest bearing liability has a corresponding interest accrual. 4) Review and vouch interest adjustments, interest paid directly to customers, and interest credited to deposit accounts.

20

Appendix D: Data Base Cards



**Make Decision**

Information on the Competence of the Internal Audit Staff

**Superv. & Eval.****IA Experience****Instructions to IAs****IA Qualifications**

This file contains information on the Internal Audit Staff members and how they are supervised and evaluated. If you wish to view the information in one of these files, select it by clicking on the file name.



More Competence Info **Make Decision**

Qualifications Card 1 of 4

The following cards contain information on the qualifications of the internal audit staff.

← →



More Competence Info **Make Decision**

Qualifications Card 2 of 4

The internal audit staff has satisfactory knowledge of the company's operations, processes, and procedures.

← →



More Competence Info

Make Decision

Qualifications Card 3 of 4

20% of the internal audit staff members have masters degrees. All have bachelors degrees.

← →



More Competence Info

Make Decision

Qualifications Card 4 of 4

40% of the internal audit staff members are CPAs or CIAs.

← →



More Competence Info **Make Decision**

Experience Card 1 of 4

The following cards contain information on the internal audit staff's experience.

← →



More Competence Info **Make Decision**

Experience Card 2 of 4

Experience in EDP - There is one EDP audit manager and three auditors that work on EDP audit matters as they arise.

← →



More Competence Info

Make Decision

Experience Card 3 of 4

Auditing Experience - The internal audit staff has an average of 3 years of auditing experience. The range of auditing experience is from 1 - 9 years.

← →



More Competence Info

Make Decision

Experience Card 4 of 4

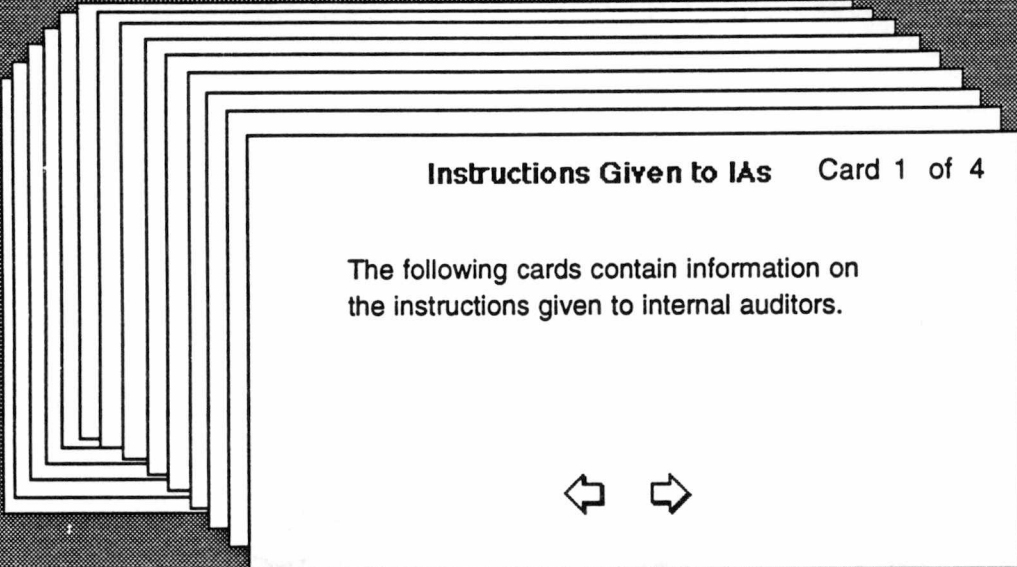
Company Experience - 14 internal audit staff members have been with the company less than 5 years. The average tenure with the company is 6.5 years.

← →



More Competence Info

Make Decision



Instructions Given to IAs Card 1 of 4

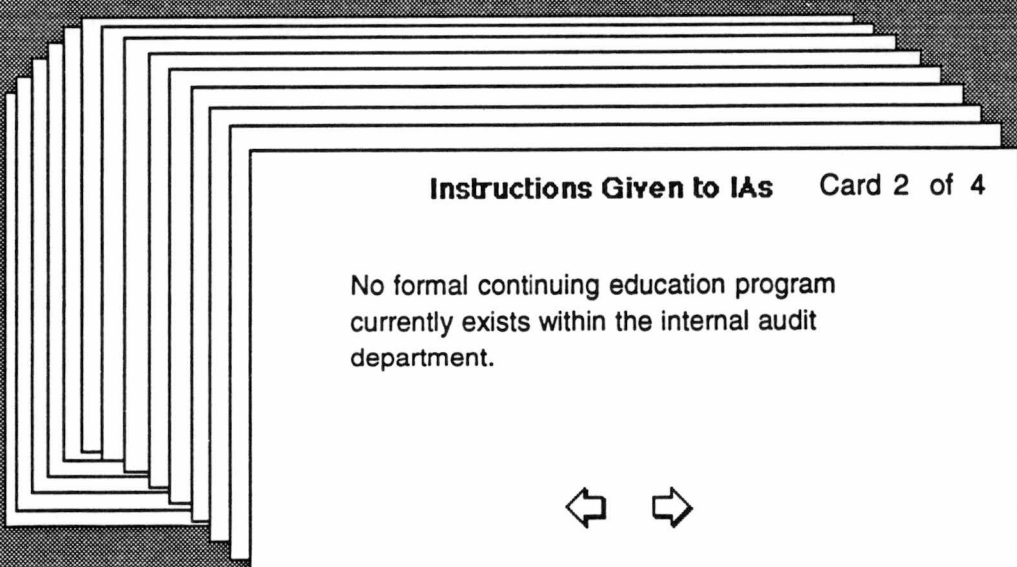
The following cards contain information on the instructions given to internal auditors.

← →



More Competence Info

Make Decision



Instructions Given to IAs Card 2 of 4

No formal continuing education program currently exists within the internal audit department.

← →



More Competence Info **Make Decision**

Instructions Given to IAs Card 3 of 4

All internal auditors must attend a two-week seminar given in-house when they join the internal audit department. The seminar involves instruction on the internal audit department's policies and procedures.

◀ ▶



More Competence Info **Make Decision**

Instructions Given to IAs Card 4 of 4

During the current period, your firm conducted a review of the internal audit department and determined that it complied with the Standards for the Professional Practice of Internal Auditing.

◀ ▶



More Competence Info

Make Decision

Supervision & Evaluation Card 1 of 6

The following cards contain information on the supervision and evaluation of internal audit staff.

← →



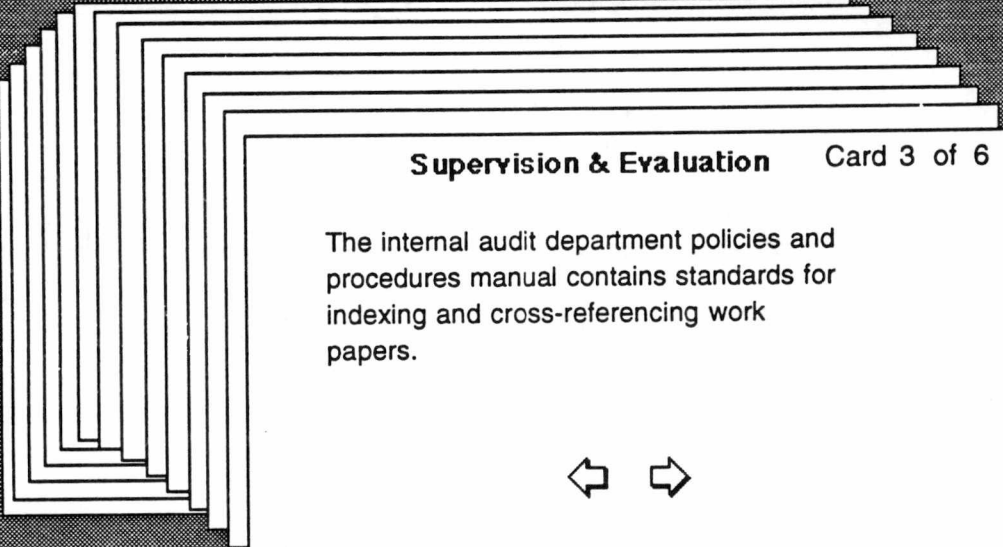
More Competence Info

Make Decision

Supervision & Evaluation Card 2 of 6

In 40% of internal audit department audits, instruction and supervision by senior IA personnel have been satisfactory.

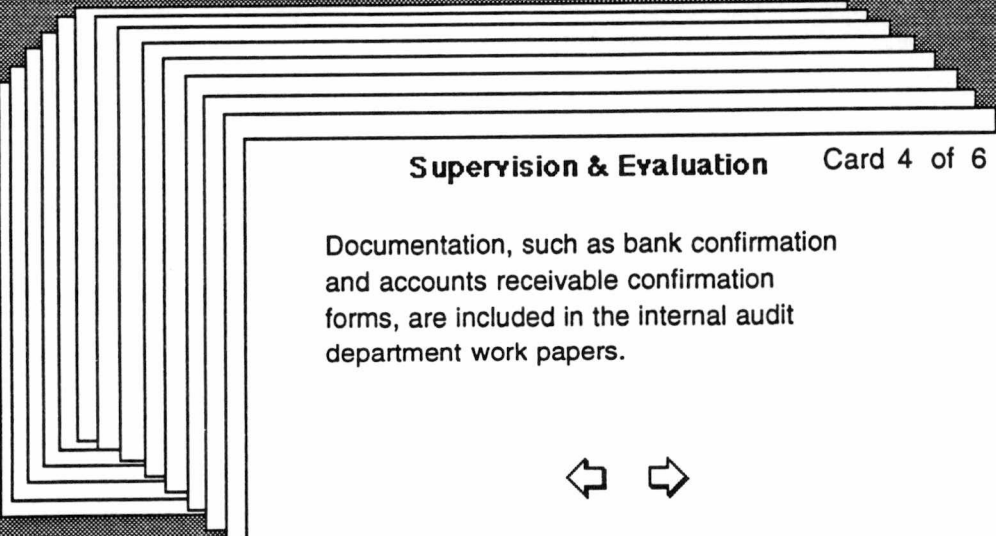
← →

**More Competence Info****Make Decision**

Supervision & Evaluation Card 3 of 6

The internal audit department policies and procedures manual contains standards for indexing and cross-referencing work papers.

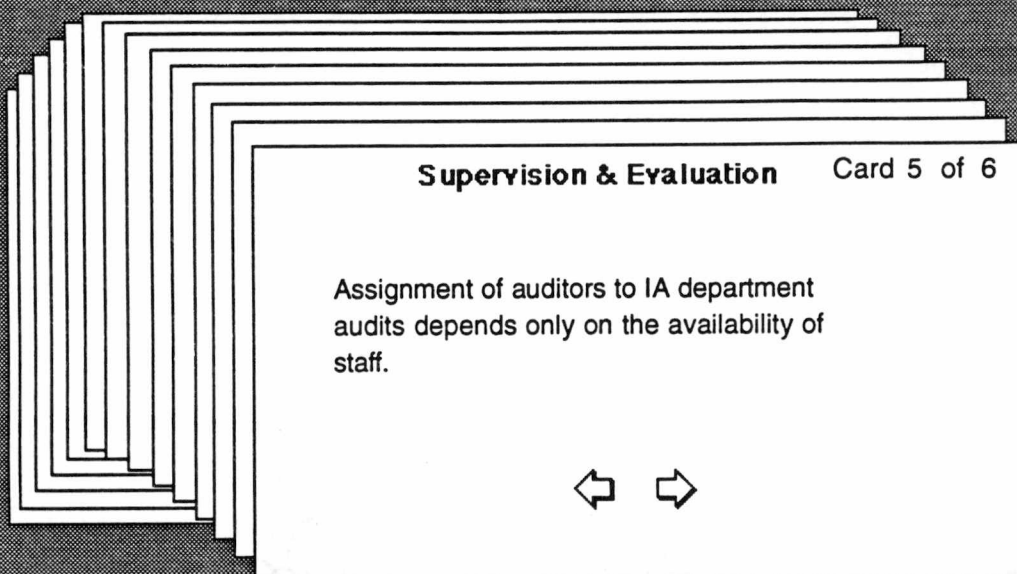
← →

**More Competence Info****Make Decision**

Supervision & Evaluation Card 4 of 6

Documentation, such as bank confirmation and accounts receivable confirmation forms, are included in the internal audit department work papers.

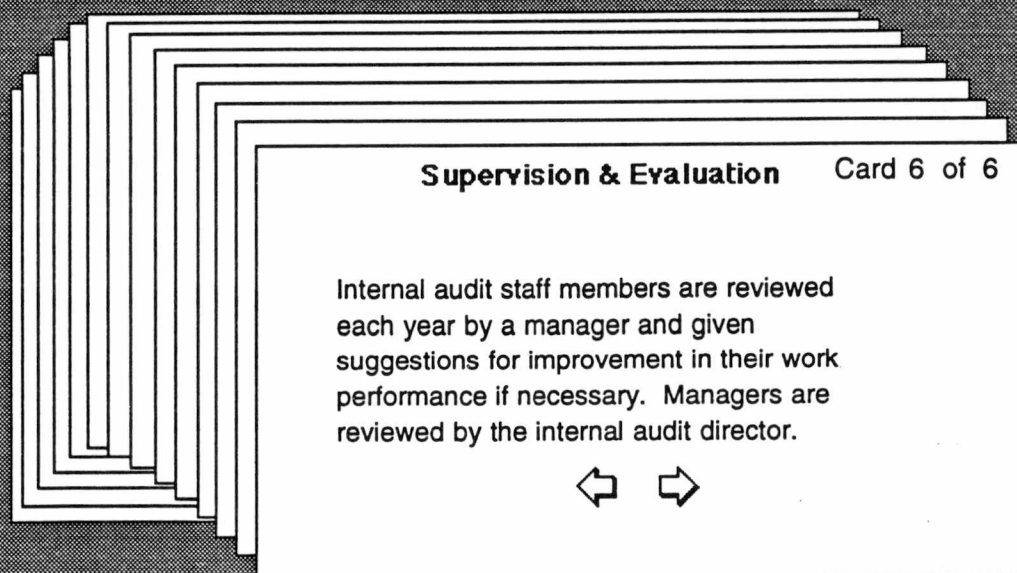
← →

**More Competence Info****Make Decision**

Supervision & Evaluation Card 5 of 6

Assignment of auditors to IA department audits depends only on the availability of staff.

← →

**More Competence Info****Make Decision**

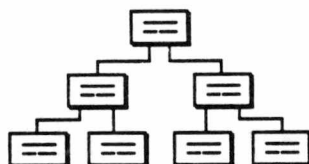
Supervision & Evaluation Card 6 of 6

Internal audit staff members are reviewed each year by a manager and given suggestions for improvement in their work performance if necessary. Managers are reviewed by the internal audit director.

← →

**Make Decision**

Information on the Objectivity of the Internal Audit Staff

**IA Independence****Top Mgt. Support****Reporting Level**

This file contains information on factors related to the internal audit staff's ability to remain objective with respect to the areas they audit. If you wish to view the information in any of these files, select it by clicking on the file name.



More Objectivity Info **Make Decision**

Independence Card 1 of 4

The following cards contain information on the independence of the internal audit department.

◀ ▶



More Objectivity Info **Make Decision**

Independence Card 2 of 4

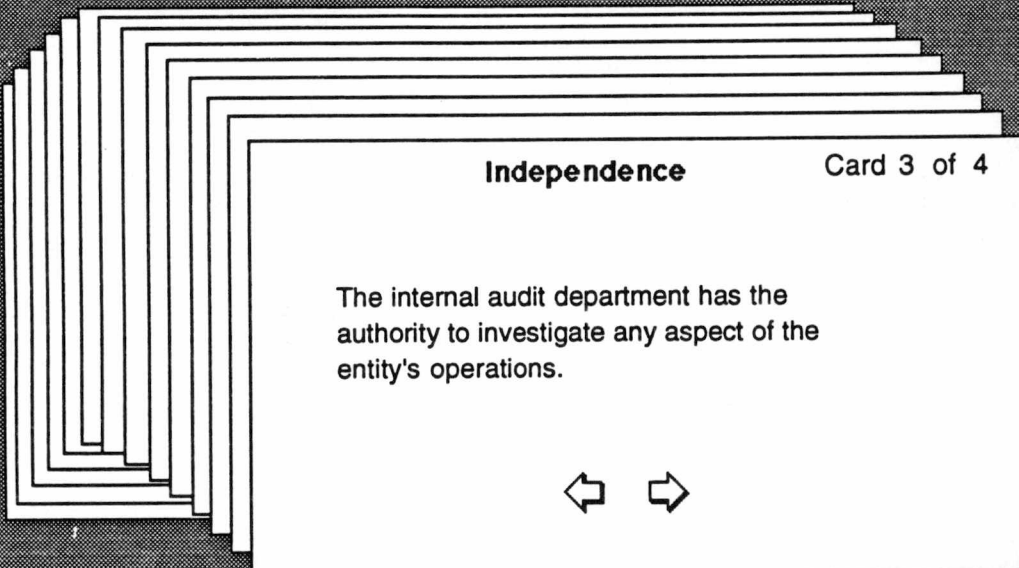
40% of the internal audit department's time is spent on operating responsibilities that conflict with the internal audit role.

◀ ▶



More Objectivity Info

Make Decision



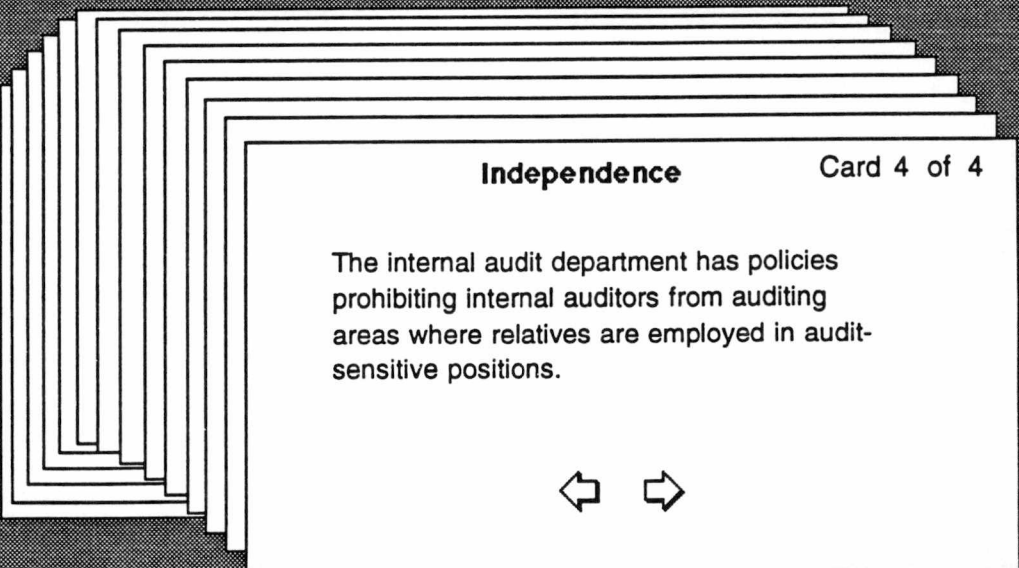
Independence Card 3 of 4

The internal audit department has the authority to investigate any aspect of the entity's operations.



More Objectivity Info

Make Decision



Independence Card 4 of 4

The internal audit department has policies prohibiting internal auditors from auditing areas where relatives are employed in audit-sensitive positions.





More Objectivity Info **Make Decision**

Reporting Level Card 1 of 4

The following cards contain information on the IA department's access to top management and the audit committee.

← →



More Objectivity Info **Make Decision**

Reporting Level Card 2 of 4

The internal audit department reports findings directly to the Chairman of the Audit Committee.

← →



More Objectivity Info

Make Decision

Reporting Level Card 3 of 4

The internal audit department reports administratively to the company's Chief Financial Officer.

← →



More Objectivity Info

Make Decision

Reporting Level Card 4 of 4

The internal audit department director meets privately with the audit committee at each audit committee meeting.

← →



More Objectivity Info

Make Decision

Top Mgt. Support Card 1 of 5

The following cards contain information on top management's support of the internal audit department.

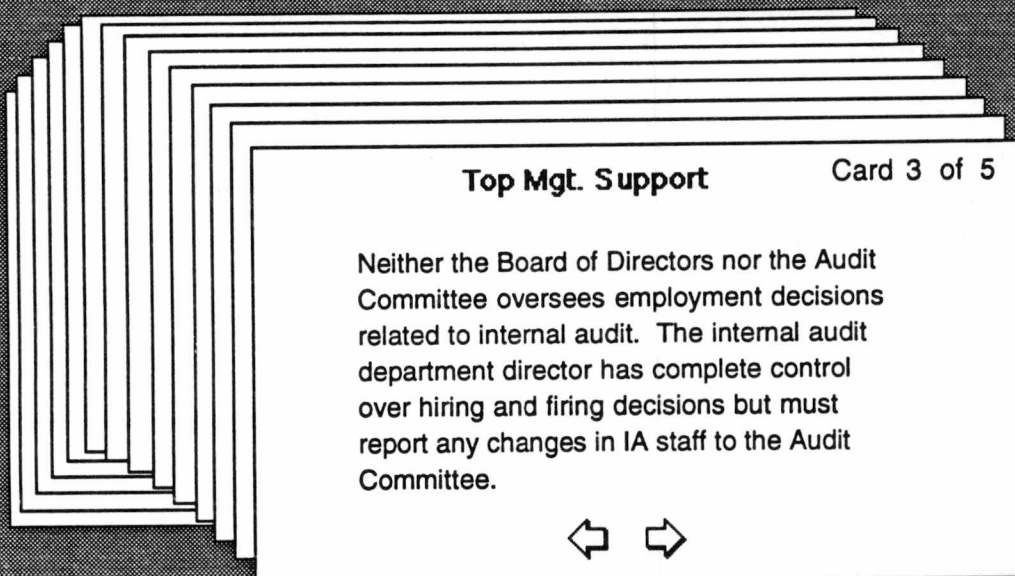
More Objectivity Info

Make Decision

Top Mgt. Support Card 2 of 5

The internal audit department director has direct access to the Chief Executive Officer and the Board of Directors of the company.

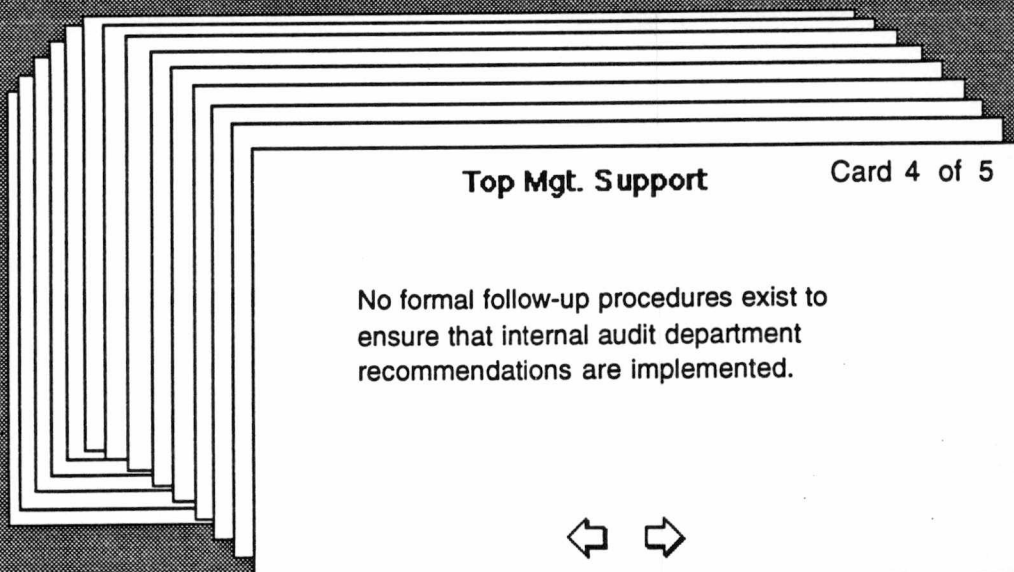
 

**More Objectivity Info****Make Decision**

Top Mgt. Support Card 3 of 5

Neither the Board of Directors nor the Audit Committee oversees employment decisions related to internal audit. The internal audit department director has complete control over hiring and firing decisions but must report any changes in IA staff to the Audit Committee.

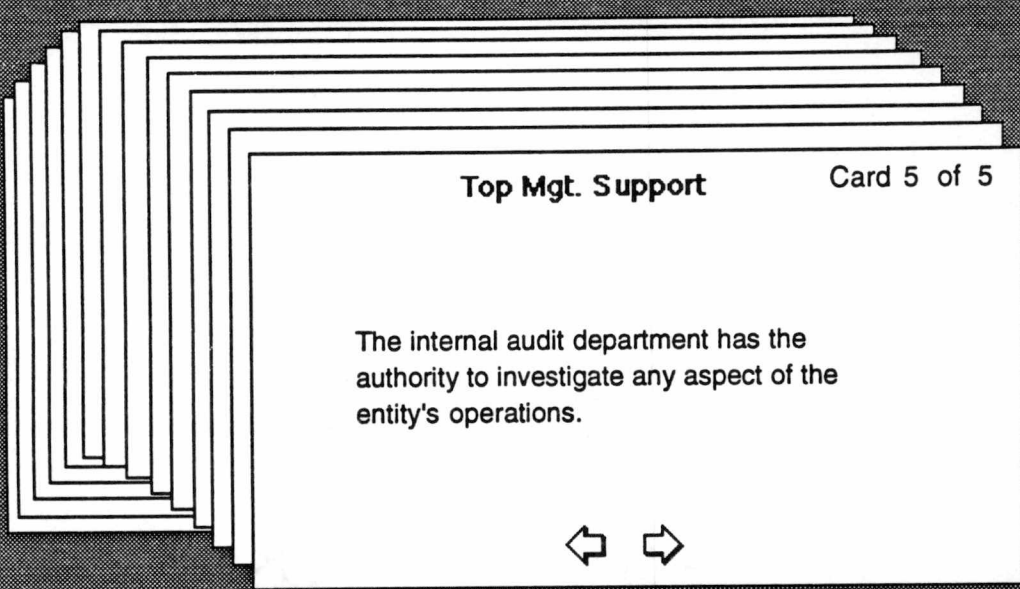
← →

**More Objectivity Info****Make Decision**

Top Mgt. Support Card 4 of 5

No formal follow-up procedures exist to ensure that internal audit department recommendations are implemented.

← →



More Objectivity Info

Make Decision

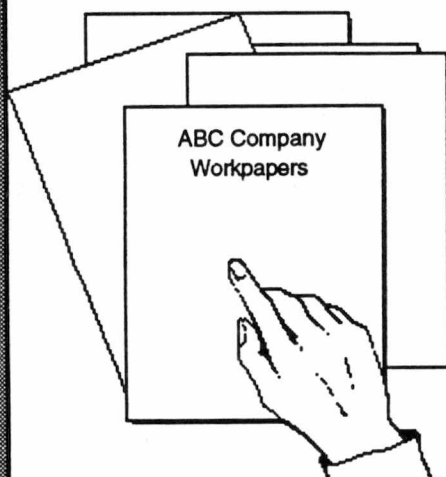
Top Mgt. Support

Card 5 of 5

The internal audit department has the authority to investigate any aspect of the entity's operations.

**Make Decision**

Information on the Internal Audit Staff's Work Performance

**Documentation****Org. Support of IA****Superv. of IA Staff****Scope of Audits**

This file contains information on the internal audit staff's work performance as it relates to financial audit activities. If you wish to view the information in any of these files, select it by clicking on the file name.



More Work Performance Info **Make Decision**

Scope of Audits Card 1 of 3

The following cards contain information on the scope of internal audit department audits.

← →



More Work Performance Info **Make Decision**

Scope of Audits Card 2 of 3

In 60% of the audits reviewed, the number of items examined by internal audit was considered satisfactory.

← →

**More Work Performance Info****Make Decision**A stack of several white rectangular cards with black borders, fanned out from left to right. The top card is the most prominent.

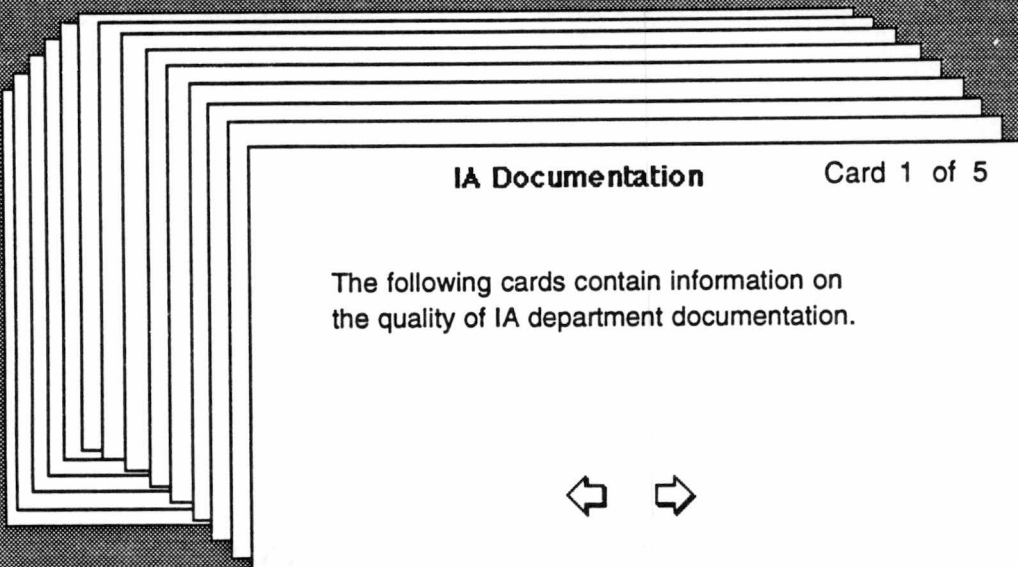
Scope of Audits Card 3 of 3

In 50% of the audits reviewed, the hours assigned to each audit area were considered satisfactory.

← →



More Work Performance Info **Make Decision**



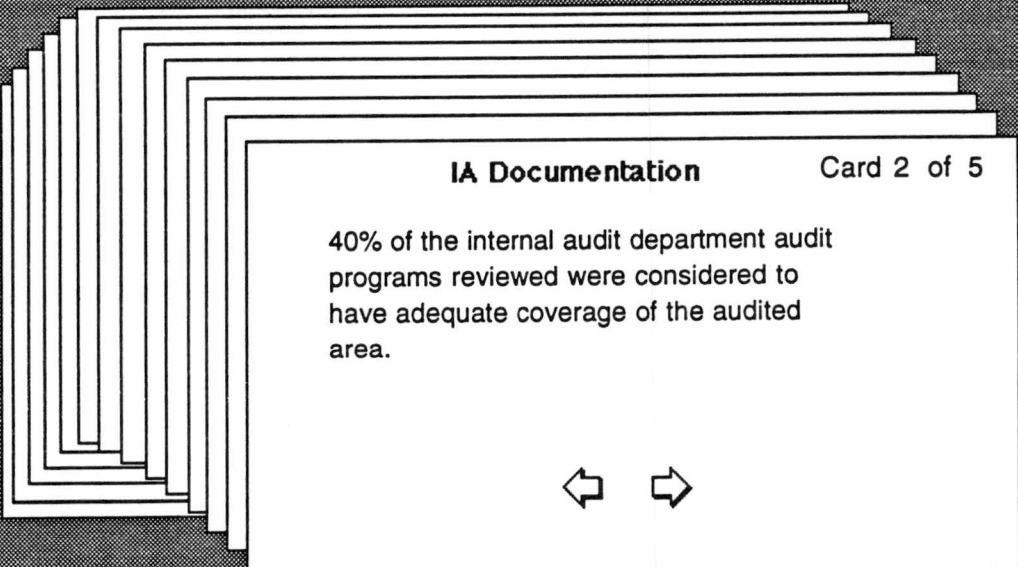
IA Documentation Card 1 of 5

The following cards contain information on the quality of IA department documentation.

← →



More Work Performance Info **Make Decision**



IA Documentation Card 2 of 5

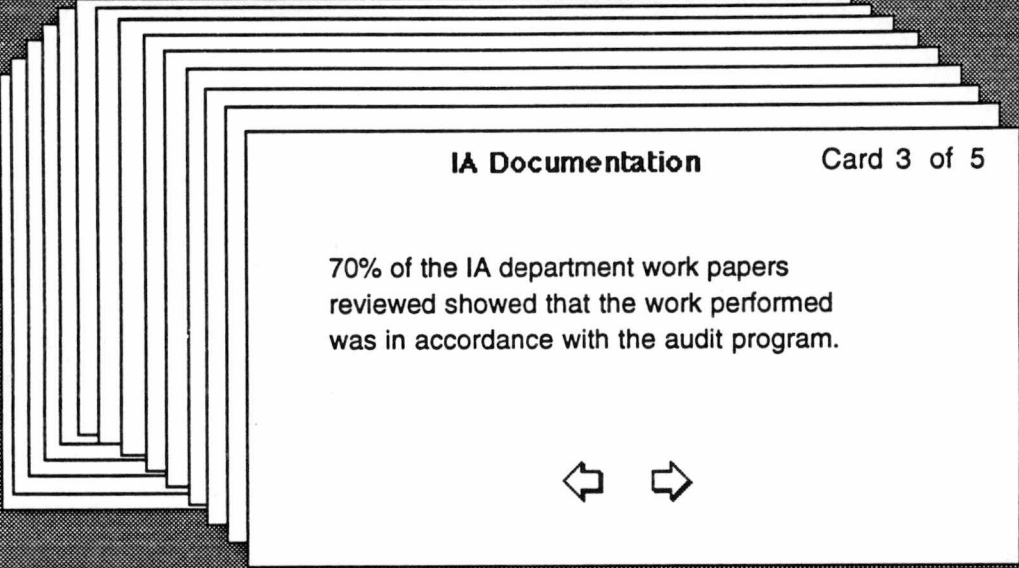
40% of the internal audit department audit programs reviewed were considered to have adequate coverage of the audited area.

← →



More Work Performance Info

Make Decision



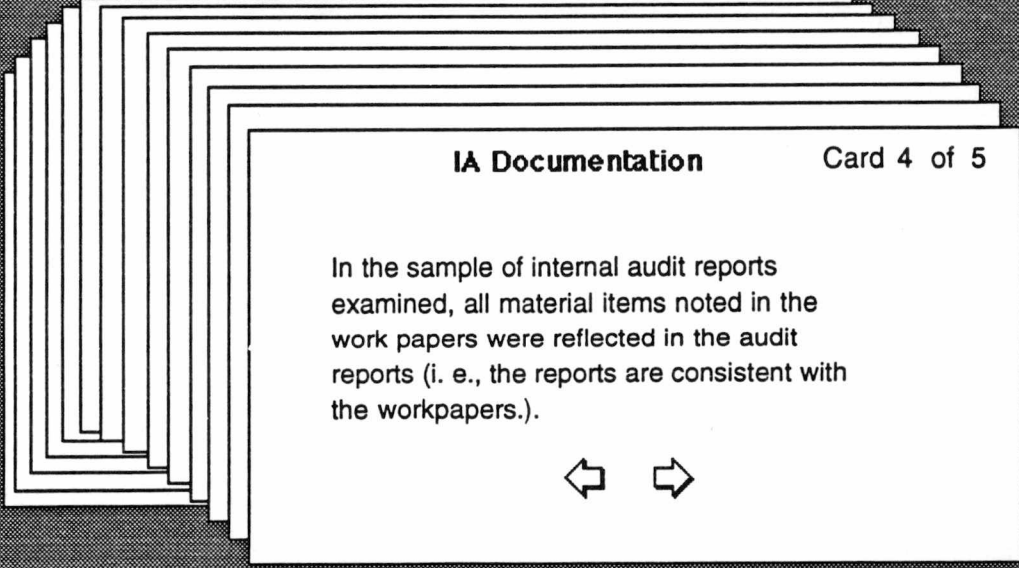
IA Documentation Card 3 of 5

70% of the IA department work papers reviewed showed that the work performed was in accordance with the audit program.

More Work Performance Info

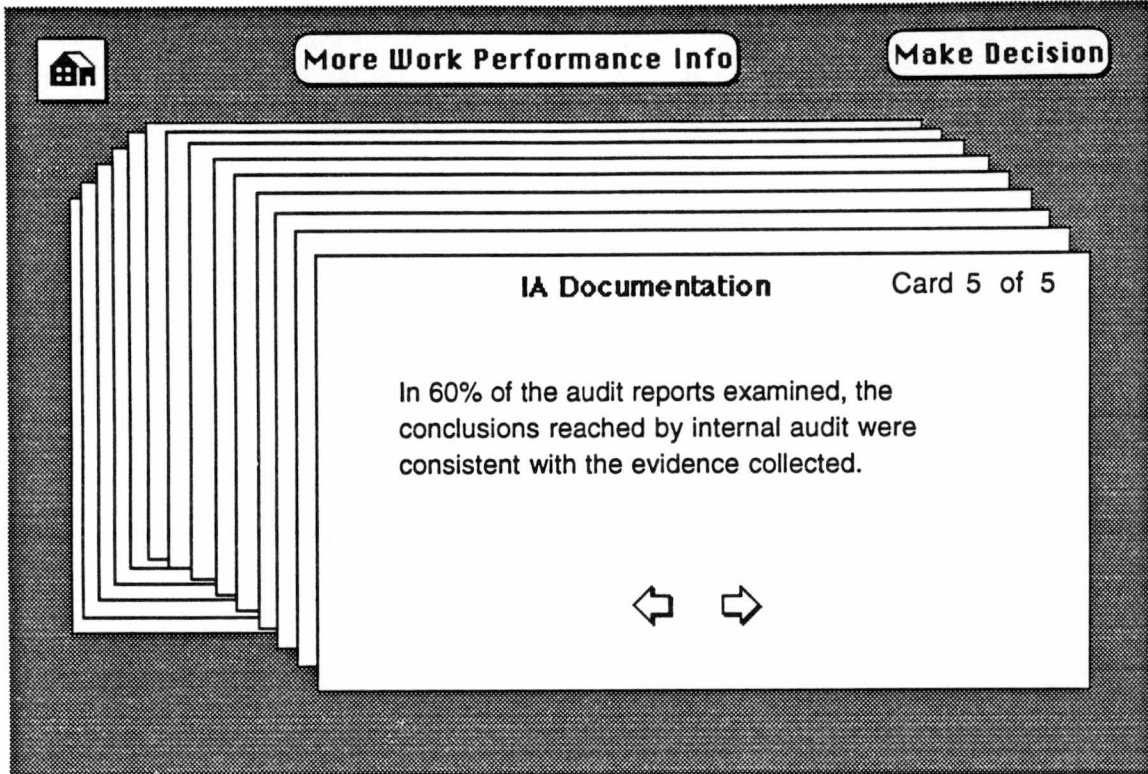
Make Decision



IA Documentation Card 4 of 5

In the sample of internal audit reports examined, all material items noted in the work papers were reflected in the audit reports (i. e., the reports are consistent with the workpapers.).



 **More Work Performance Info** **Make Decision**

IA Documentation Card 5 of 5

In 60% of the audit reports examined, the conclusions reached by internal audit were consistent with the evidence collected.

← →



More Work Performance Info **Make Decision**

Supervision Card 1 of 3

The following cards contain information on the supervision of internal audit staff.

← →



More Work Performance Info **Make Decision**

Supervision Card 2 of 3

All workpapers are reviewed by the senior auditor in charge of the audit. Reports are reviewed by the manager in charge of the audit.

← →

**More Work Performance Info****Make Decision**A stack of several white rectangular cards with black borders, fanned out from left to right. The top card is the most prominent and contains the following text:

Supervision Card 3 of 3

The manager and senior auditor in charge of the audit are responsible for developing the audit program and planning the work.

← →



More Work Performance Info **Make Decision**

Implementation of Findings Card 1 of 3
(Org. Support)

The following cards contain information on the implementation of the internal auditors' findings.



More Work Performance Info **Make Decision**

Implementation of Findings Card 2 of 3

80% of the managers of audited areas have reported that internal audit recommendations were followed although no formal procedures exist for ensuring that the recommendations are followed.

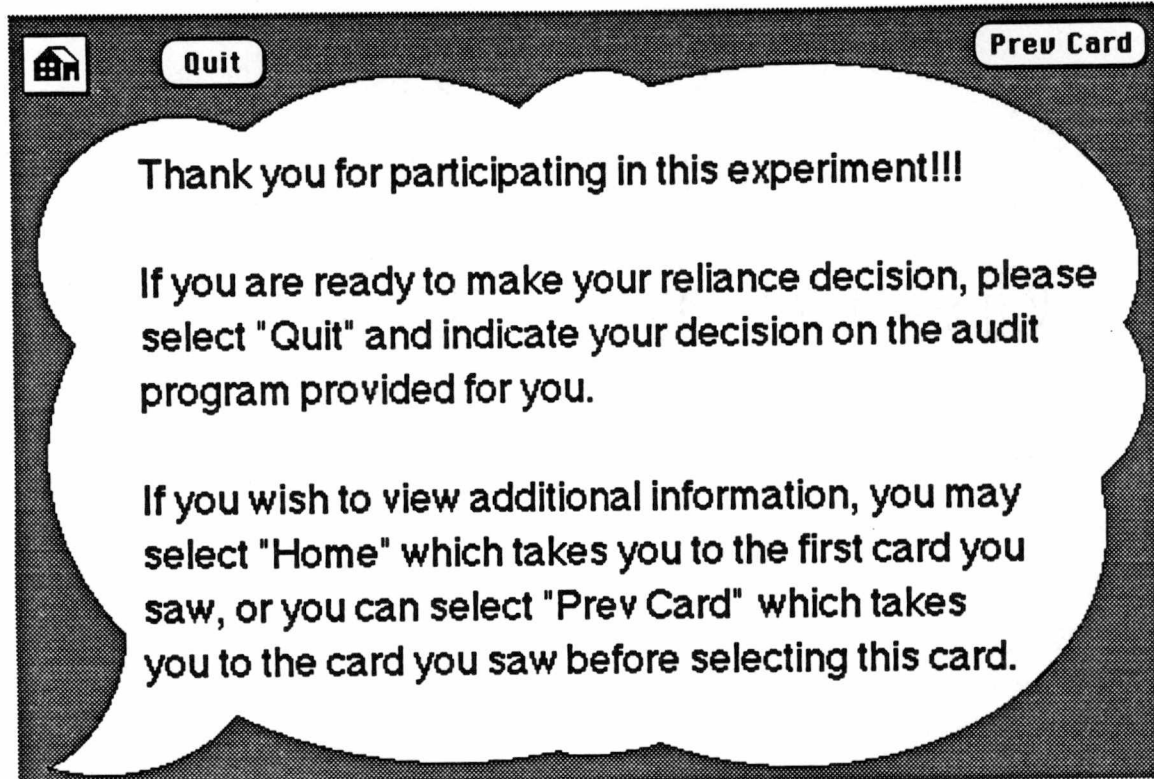


**More Work Performance Info****Make Decision****Implementation of Findings**

Card 3 of 3

No formal follow-up procedures exist to ensure that errors or exceptions noted in internal audit department audits are adequately investigated.





Appendix E: GEFT and FIT Instructions

Group Embedded Figures Test Instructions

The following instructions were read aloud by the researcher to the auditors participating in the study. The examples that are mentioned in the instructions were shown on overhead transparencies and demonstrated by the researcher.

On the front of your test booklet is a simple figure labeled "X". Immediately below this figure is a more complex figure. The simple figure "X" is hidden in this more complex figure. Your task is to find the simple figure and trace it directly over the lines of the complex figure (show example). Notice that the simple figure is the same size, in the same proportions, and faces in the same direction within the complex figure as when it appeared alone (show example).

On the following pages of the test booklet are several problems like the one just illustrated. On each page you will see a complex figure, and under it will be a letter corresponding to the simple figure that is hidden within it. On the back of your test booklet are the simple figures and their corresponding letters. You must locate the simple figure within the complex figure and trace it over the lines of the complex figure.

You may look back at the simple figures as often as necessary. Trace only one simple figure in each problem even if you locate more than one. The simple form is always present in the complex figure in the same size, the same proportions, and facing in the same direction as it appears on the back cover of this booklet.

Any questions?

You have 10 minutes to complete both sections of this test.

Figural Intersections Test Instructions

The following instructions were read aloud by the researcher to the auditors participating in the study. The examples that are mentioned in the instructions were shown on overhead transparencies and demonstrated by the researcher.

Notice on the front of your test booklet that there are 2 sets of figures. The set on the right presents each figure discretely. It is called the presentation set. The set on the left shows the figures arranged in an overlapping way so that there is only one area of common intersection. It is called the test set. Your task is to identify and mark the area of common intersection in the test set (show example).

The shapes in the two sets may differ in size or orientation, but they match in shape and proportion (show example). In some items, the test set contains a shape that is not included in the presentation set. This is an irrelevant shape, and you should ignore it when looking for the area of common intersection (show example).

Please make only one mark on the test set; that is, mark the area of common intersection only. This means that you cannot outline the shapes on the test set or mark more than one area on the test set. If you do, the item will be counted wrong.

Are there any questions?

You have 15 minutes to complete the test. Begin.

Appendix F: Debriefing Questionnaire

Debriefing Questionnaire

I.D.# _____

The following questions are designed to obtain demographic information about you for use by the researcher in analyzing results. Please check or write in the appropriate response. All information will be kept strictly confidential and will be used in summary form only.

1. Highest degree earned: Bachelors _____
 Masters _____
 Doctorate _____
2. Certificates held: CPA _____
 CMA _____
 CIA _____
 Others _____
 (please specify)
3. Current position: Senior _____
 Manager _____
 Senior Manager _____
 Partner _____
 Other _____
 (please specify)
4. Length of time at this position: _____
5. Length of time with this firm: _____
6. Length of time in public accounting: _____
7. How long have you been making reliance decisions?
8. What position (or title) did you hold when you first began making reliance decisions?
9. In what industry or industries were clients for whom you have made reliance decisions?
10. Your age: _____
11. Your gender: Male _____
 Female _____
12. How realistic was this task? That is, were the materials encountered in the data base similar to the information you use in making actual reliance decisions?

Appendix G: Tracing Program Report

11/25/91 9:56:42 AM

Objectivity Information 9:57:37 AM

OBJ-Independence 9:57:45 AM -Begin

card id 2879 of stack "AWS :APPLICATIONS:OBJ-Independence" 9:57:45 AM

card id 2879 of stack "AWS :APPLICATIONS:OBJ-Independence" 9:57:48 AM

card id 3654 of stack "AWS :APPLICATIONS:OBJ-Independence" 9:57:48 AM

card id 3654 of stack "AWS :APPLICATIONS:OBJ-Independence" 9:57:52 AM

card id 4075 of stack "AWS :APPLICATIONS:OBJ-Independence" 9:57:53 AM

card id 4075 of stack "AWS :APPLICATIONS:OBJ-Independence" 9:57:55 AM

card id 4341 of stack "AWS :APPLICATIONS:OBJ-Independence" 9:57:56 AM

card id 4341 of stack "AWS :APPLICATIONS:OBJ-Independence" 9:58:00 AM

card id 2879 of stack "AWS :APPLICATIONS:OBJ-Independence" 9:58:01 AM

card id 2879 of stack "AWS :APPLICATIONS:OBJ-Independence" 9:58:03 AM

card id 3654 of stack "AWS :APPLICATIONS:OBJ-Independence" 9:58:04 AM

card id 3654 of stack "AWS :APPLICATIONS:OBJ-Independence" 9:58:07 AM

card id 2879 of stack "AWS :APPLICATIONS:OBJ-Independence" 9:58:08 AM

card id 2879 of stack "AWS :APPLICATIONS:OBJ-Independence" 9:58:10 AM

OBJ-Independence 9:58:10 AM -End

Objectivity Information 9:58:13 AM

OBJ-Org. Reporting Level 9:58:18 AM -Begin

card id 2951 of stack "AWS :APPLICATIONS:OBJ-Org. Reporting Level" 9:58:18 AM

card id 2951 of stack "AWS :APPLICATIONS:OBJ-Org. Reporting Level" 9:58:21 AM

card id 3818 of stack "AWS :APPLICATIONS:OBJ-Org. Reporting Level" 9:58:22 AM

card id 3818 of stack "AWS :APPLICATIONS:OBJ-Org. Reporting Level" 9:58:27 AM

card id 3860 of stack "AWS :APPLICATIONS:OBJ-Org. Reporting Level" 9:58:28 AM

card id 3860 of stack "AWS :APPLICATIONS:OBJ-Org. Reporting Level" 9:58:31 AM

card id 4201 of stack "AWS :APPLICATIONS:OBJ-Org. Reporting Level" 9:58:32 AM

card id 4201 of stack "AWS :APPLICATIONS:OBJ-Org. Reporting Level" 9:58:40 AM

card id 2951 of stack "AWS :APPLICATIONS:OBJ-Org. Reporting Level" 9:58:41 AM

card id 2951 of stack "AWS :APPLICATIONS:OBJ-Org. Reporting Level" 9:58:46 AM

card id 4201 of stack "AWS :APPLICATIONS:OBJ-Org. Reporting Level" 9:58:48 AM

card id 4201 of stack "AWS :APPLICATIONS:OBJ-Org. Reporting Level" 9:58:53 AM

card id 3860 of stack "AWS :APPLICATIONS:OBJ-Org. Reporting Level" 9:58:54 AM

card id 3860 of stack "AWS :APPLICATIONS:OBJ-Org. Reporting Level" 9:58:56 AM

card id 3818 of stack "AWS :APPLICATIONS:OBJ-Org. Reporting Level" 9:58:57 AM

card id 3818 of stack "AWS :APPLICATIONS:OBJ-Org. Reporting Level" 9:58:58 AM

card id 2951 of stack "AWS :APPLICATIONS:OBJ-Org. Reporting Level" 9:58:59 AM

card id 2951 of stack "AWS :APPLICATIONS:OBJ-Org. Reporting Level" 9:59:02 AM

OBJ-Org. Reporting Level 9:59:02 AM -End

Objectivity Information 9:59:06 AM

OBJ-Top Mgt. Support 9:59:11 AM -Begin

card id 2986 of stack "AWS :APPLICATIONS:OBJ-Top Mgt. Support" 9:59:12 AM

card id 2986 of stack "AWS :APPLICATIONS:OBJ-Top Mgt. Support" 9:59:17 AM

card id 3693 of stack "AWS :APPLICATIONS:OBJ-Top Mgt. Support" 9:59:19 AM

card id 3693 of stack "AWS :APPLICATIONS:OBJ-Top Mgt. Support" 9:59:21 AM

card id 3942 of stack "AWS :APPLICATIONS:OBJ-Top Mgt. Support" 9:59:22 AM

card id 3942 of stack "AWS :APPLICATIONS:OBJ-Top Mgt. Support" 9:59:29 AM

card id 4320 of stack "AWS :APPLICATIONS:OBJ-Top Mgt. Support" 9:59:30 AM

card id 4320 of stack "AWS :APPLICATIONS:OBJ-Top Mgt. Support" 9:59:33 AM

card id 4561 of stack "AWS :APPLICATIONS:OBJ-Top Mgt. Support" 9:59:35 AM

card id 4561 of stack "AWS :APPLICATIONS:OBJ-Top Mgt. Support" 9:59:38 AM

card id 2986 of stack "AWS :APPLICATIONS:OBJ-Top Mgt. Support" 9:59:40 AM

card id 2986 of stack "AWS :APPLICATIONS:OBJ-Top Mgt. Support" 9:59:42 AM

OBJ-Top Mgt. Support 9:59:43 AM -End

Objectivity Information 9:59:46 AM

Competence Information 9:59:55 AM

CMP-Qualifications 10:00:00 AM -Begin

card id 2823 of stack "AWS :APPLICATIONS:CMP-Qualifications" 10:00:01 AM
 card id 2823 of stack "AWS :APPLICATIONS:CMP-Qualifications" 10:00:03 AM
 card id 3609 of stack "AWS :APPLICATIONS:CMP-Qualifications" 10:00:04 AM
 card id 3609 of stack "AWS :APPLICATIONS:CMP-Qualifications" 10:00:06 AM
 card id 3849 of stack "AWS :APPLICATIONS:CMP-Qualifications" 10:00:08 AM
 card id 3849 of stack "AWS :APPLICATIONS:CMP-Qualifications" 10:00:10 AM
 card id 4127 of stack "AWS :APPLICATIONS:CMP-Qualifications" 10:00:11 AM
 card id 4127 of stack "AWS :APPLICATIONS:CMP-Qualifications" 10:00:12 AM
 card id 2823 of stack "AWS :APPLICATIONS:CMP-Qualifications" 10:00:14 AM
 card id 2823 of stack "AWS :APPLICATIONS:CMP-Qualifications" 10:00:15 AM
 CMP-Qualifications 10:00:16 AM -End
 Competence Information 10:00:20 AM
 CMP-Instructions 10:00:24 AM -Begin
 card id 2973 of stack "AWS :APPLICATIONS:CMP-Instructions" 10:00:26 AM
 card id 2973 of stack "AWS :APPLICATIONS:CMP-Instructions" 10:00:28 AM
 card id 3813 of stack "AWS :APPLICATIONS:CMP-Instructions" 10:00:29 AM
 card id 3813 of stack "AWS :APPLICATIONS:CMP-Instructions" 10:00:31 AM
 card id 3998 of stack "AWS :APPLICATIONS:CMP-Instructions" 10:00:33 AM
 card id 3998 of stack "AWS :APPLICATIONS:CMP-Instructions" 10:00:36 AM
 card id 4161 of stack "AWS :APPLICATIONS:CMP-Instructions" 10:00:38 AM
 card id 4161 of stack "AWS :APPLICATIONS:CMP-Instructions" 10:00:45 AM
 CMP-Instructions 10:00:46 AM -End
 Competence Information 10:00:50 AM
 CMP-Experience 10:00:58 AM -Begin
 card id 2997 of stack "AWS :APPLICATIONS:CMP-Experience" 10:00:59 AM
 card id 2997 of stack "AWS :APPLICATIONS:CMP-Experience" 10:01:00 AM
 card id 3789 of stack "AWS :APPLICATIONS:CMP-Experience" 10:01:02 AM
 card id 3789 of stack "AWS :APPLICATIONS:CMP-Experience" 10:01:04 AM
 card id 3882 of stack "AWS :APPLICATIONS:CMP-Experience" 10:01:06 AM
 card id 3882 of stack "AWS :APPLICATIONS:CMP-Experience" 10:01:08 AM
 card id 4119 of stack "AWS :APPLICATIONS:CMP-Experience" 10:01:10 AM
 card id 4119 of stack "AWS :APPLICATIONS:CMP-Experience" 10:01:16 AM
 CMP-Experience 10:01:17 AM -End
 Competence Information 10:01:20 AM
 CMP-Supervision & Evaluation 10:01:25 AM -Begin
 card id 2840 of stack "AWS :APPLICATIONS:CMP-Supervision & Evaluation" 10:01:27 AM
 card id 2840 of stack "AWS :APPLICATIONS:CMP-Supervision & Evaluation" 10:01:29 AM
 card id 3608 of stack "AWS :APPLICATIONS:CMP-Supervision & Evaluation" 10:01:30 AM
 card id 3608 of stack "AWS :APPLICATIONS:CMP-Supervision & Evaluation" 10:01:35 AM
 card id 4015 of stack "AWS :APPLICATIONS:CMP-Supervision & Evaluation" 10:01:37 AM
 card id 4015 of stack "AWS :APPLICATIONS:CMP-Supervision & Evaluation" 10:01:39 AM
 card id 4350 of stack "AWS :APPLICATIONS:CMP-Supervision & Evaluation" 10:01:41 AM
 card id 4350 of stack "AWS :APPLICATIONS:CMP-Supervision & Evaluation" 10:01:44 AM
 card id 4510 of stack "AWS :APPLICATIONS:CMP-Supervision & Evaluation" 10:01:45 AM
 card id 4510 of stack "AWS :APPLICATIONS:CMP-Supervision & Evaluation" 10:01:57 AM
 card id 4792 of stack "AWS :APPLICATIONS:CMP-Supervision & Evaluation" 10:01:59 AM
 card id 4792 of stack "AWS :APPLICATIONS:CMP-Supervision & Evaluation" 10:02:03 AM
 CMP-Supervision & Evaluation 10:02:05 AM -End
 Competence Information 10:02:08 AM
 Work Performance Info 10:02:17 AM
 WRK-Scope of Audits 10:02:22 AM -Begin
 card id 2862 of stack "AWS :APPLICATIONS:WRK-Scope of Audits" 10:02:23 AM
 card id 2862 of stack "AWS :APPLICATIONS:WRK-Scope of Audits" 10:02:25 AM
 card id 3599 of stack "AWS :APPLICATIONS:WRK-Scope of Audits" 10:02:27 AM
 card id 3599 of stack "AWS :APPLICATIONS:WRK-Scope of Audits" 10:02:33 AM
 card id 3897 of stack "AWS :APPLICATIONS:WRK-Scope of Audits" 10:02:35 AM
 card id 3897 of stack "AWS :APPLICATIONS:WRK-Scope of Audits" 10:02:37 AM
 card id 2862 of stack "AWS :APPLICATIONS:WRK-Scope of Audits" 10:02:39 AM

card id 2862 of stack "AWS :APPLICATIONS:WRK-Scope of Audits" 10:02:41 AM
WRK-Scope of Audits 10:02:42 AM -End
Work Performance Info 10:02:47 AM
WRK-Supervision 10:02:53 AM -Begin
card id 2957 of stack "AWS :APPLICATIONS:WRK-Supervision" 10:02:55 AM
card id 2957 of stack "AWS :APPLICATIONS:WRK-Supervision" 10:02:57 AM
card id 3771 of stack "AWS :APPLICATIONS:WRK-Supervision" 10:02:59 AM
card id 3771 of stack "AWS :APPLICATIONS:WRK-Supervision" 10:03:04 AM
card id 3911 of stack "AWS :APPLICATIONS:WRK-Supervision" 10:03:05 AM
card id 3911 of stack "AWS :APPLICATIONS:WRK-Supervision" 10:03:11 AM
WRK-Supervision 10:03:13 AM -End
Work Performance Info 10:03:17 AM
WRK-IA Documentation 10:03:24 AM -Begin
card id 2940 of stack "AWS :APPLICATIONS:WRK-IA Documentation" 10:03:25 AM
card id 2940 of stack "AWS :APPLICATIONS:WRK-IA Documentation" 10:03:27 AM
card id 3816 of stack "AWS :APPLICATIONS:WRK-IA Documentation" 10:03:29 AM
card id 3816 of stack "AWS :APPLICATIONS:WRK-IA Documentation" 10:03:35 AM
card id 4019 of stack "AWS :APPLICATIONS:WRK-IA Documentation" 10:03:37 AM
card id 4019 of stack "AWS :APPLICATIONS:WRK-IA Documentation" 10:03:40 AM
card id 4308 of stack "AWS :APPLICATIONS:WRK-IA Documentation" 10:03:42 AM
card id 4308 of stack "AWS :APPLICATIONS:WRK-IA Documentation" 10:03:46 AM
card id 4420 of stack "AWS :APPLICATIONS:WRK-IA Documentation" 10:03:48 AM
card id 4420 of stack "AWS :APPLICATIONS:WRK-IA Documentation" 10:03:52 AM
WRK-IA Documentation 10:03:53 AM -End
Work Performance Info 10:03:57 AM
WRK-Org. Support 10:04:03 AM -Begin
card id 2906 of stack "AWS :APPLICATIONS:WRK-Org. Support" 10:04:05 AM
card id 2906 of stack "AWS :APPLICATIONS:WRK-Org. Support" 10:04:07 AM
card id 3770 of stack "AWS :APPLICATIONS:WRK-Org. Support" 10:04:09 AM
card id 3770 of stack "AWS :APPLICATIONS:WRK-Org. Support" 10:04:29 AM
card id 4066 of stack "AWS :APPLICATIONS:WRK-Org. Support" 10:04:31 AM
card id 4066 of stack "AWS :APPLICATIONS:WRK-Org. Support" 10:04:36 AM
WRK-Org. Support 10:04:38 AM -End
Work Performance Info 10:04:42 AM
10:04:53 AM -Final
10:07:32 AM -Final
10:07:39 AM -Quit

VITA

Tina G. Youngblood was born on January 14, 1965, in Madison, Tennessee. After graduating from Upperman High School in Baxter, Tennessee in 1983, Tina enrolled in Tennessee Technological University in Cookeville, Tennessee. She received a Bachelor of Science in Business Administration degree in 1987 and a Master of Business Administration degree in 1988. Immediately after graduation, she enrolled in the University of Tennessee's Ph.D. program in accounting. In January, 1992, Tina accepted a tenure track position in the Department of Accountancy at Miami University in Oxford, Ohio.