A STUDY OF THE EFFECTS OF CONSERVATISM ON THE EVIDENTIAL
SAMPLE-SIZE DECISIONS MADE BY AUDITORS

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This research was undertaken to test the effects of conservatism on the decisions made by auditors. Two of the instruments chosen for this task were psychological tests, the Wilson and Patterson Conservatism Scale and Kogan and Wallach's Choice Dilemmas Procedure. The psychological tests were used to measure conservatism on two bases: resistance to change and aversion to risk. The other instrument, an audit judgment case, was the source of the evidential sample-size decisions. An effort was made to design a case that would have as much external validity as possible and still be capable of overriding firm effects in decision-making.

These research tools were administered to 116 practicing auditors employed by nine large public accounting firms in Dallas. The subjects were selected on an essentially random basis, although the public accounting firms chose the date and time for administration of the research instruments. In each firm the investigator met with the subjects, provided instructions and monitored completion of the instruments.

When the data were collected and statistical analysis begun, the investigator discovered that the statistical
method planned for analyzing the data—multiple correlation and regression—could not be used due to the distribution of the dependent variable. A reasonably normal distribution is an essential requirement for multiple correlation and distribution, and the dependent variable could not meet this requirement. Instead, a non-parametric technique using statistics based on rank, Spearman's rho and Kendall's tau, was substituted.

The evaluation of the research results provided by the two psychological tests indicated that, when measured on the construct of resistance to change, auditors as a group are essentially heterogeneous and slightly conservative. However, the auditors' test scores on the construct of aversion to risk reflected a homogeneous group who were distinctly conservative.

The audit judgment case provided evidential decisions regarding sample-sizes made for three assumed clients whose internal control systems were described in the case as strong, fair, or weak. An analysis of the decisions made under these conditions using rank order correlation indicated a stronger relationship existed between sample sizes and both measures of conservatism for compliance testing than for any other sample-size decisions. This relationship was a recognized possibility by the investigator in that firm effects could suppress the personal judgment of auditors although the judgment case was carefully designed to avoid it.
Because firm policy in compliance samples could be considered weak due to their rather indirect influence on dollar error, it was not surprising that correlations for compliance samples would be larger. This weak firm policy could explain the results of the analysis as related to this specific sample of auditors. However, these correlations were not significant at the $p<0.05$ level. Therefore, the null hypothesis could not statistically be rejected. Due to the low significance level, the results of this research cannot be validly applied to auditors as a whole.

Firm effects were evaluated to discover if there was any significant difference between auditors on a firm basis using Kruskal-Wallis one-way analysis of variance. Eleven out of twelve dependent variables had Chi-square values that were significant at levels from $p<0.000$ to $p<0.005$.

Based on these results, this research seems to indicate that the firm effect is more important in auditors' decision-making than personal characteristics except, perhaps, in the area of compliance testing decisions. If this is indeed the case, it could be said that the different audit philosophies held by the public accounting firms and instilled in their auditors may be the prime cause of the substantial differences that have been continuously found in auditor judgments.
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"Accountants are specialized historians..." (10, p. 268) and the similarities that exist between the disciplines of auditing and history have been the subject of inference in Mautz and Sharaf's study (14) and of investigation in this researcher's earlier work (20). The preoccupation of both disciplines with evidence is perceived by Mautz and Sharaf to be their interrelated area of interest (14, p. 73). This same area of interest provided the basis for the investigation cited above, which was concerned with a comparison of the concepts and procedures of auditing and history as they pertain to the collection, verification and analysis of evidence.

Origin of the Study

Both auditing and history use evidence based upon the testimony of people, documents, and material objects and both have methods to verify the authenticity and credibility of such evidence. In the process of researching these methods in both disciplines (20), the author noted that an area of concern which receives great emphasis in history as affecting all levels of historical production seems to receive little overt recognition in auditing. This area of
concern pertains to the influence of the personal attitudes of both witnesses and the investigator upon all phases of collecting, verifying, and analyzing evidence.

Historians, among others, are aware that their personal interests and attitudes may have an important impact upon their work. This influence of personal qualities is often called bias.

Bias is defined simply as a "mental leaning, inclination or partiality" (21, p. 143). But carried to extremes it may mean "a commitment to a particular belief, position, or cause held so strongly that it precludes consideration or even awareness of contrary evidence and opposing views" (19, p. 149) or "a judgment reached without examination or consideration of the evidence in full" (19, p. 149) in which case it may be more properly called prejudice (20, p. 36).

Despite the broad difference in meaning between these two definitions, bias is usually thought of as synonymous with prejudice and both are given an undesirable connotation in common usage. For the purpose of this study, however, bias is defined and understood to be any pressure exerted upon decisions or actions that may result from the intervention of personal attitudes or interests. No consideration is given as to whether this pressure is good or bad.

Because historians have long recognized the influence of bias on all phases of their production, they have been
impelled to evolve a method (internal criticism) of criticizing evidence for bias and a tradition for mitigating the influence of their own bias (20, pp. 35-36).

In the auditing method of evaluating evidence, however, there seems to be little awareness of the effects of bias, either upon the evidence provided by witnesses and documents or upon the auditor's own judgment. Considering that other disciplines have long been aware of the influence of bias in their productive output, it is surprising to find no overt recognition in accounting literature of the role played by bias and prejudice. However, this void in accounting can be explained (20, p. 73).

In the beginning, auditing was concerned solely with the verification of facts. Since those facts were quantitative and completely objective, the personal leaning of the accountant was not important (20, p. 73).

As auditing evolved over the years, its emphasis gradually changed from exclusive concern with quantitative facts to a preponderant involvement with judgment and interpretation. Along with this change, the influence of personal attitudes and interests of the accountant has undoubtedly been existent since bias "is unavoidable in all products of the mind" (6, p. 180). Despite this constantly expanding emphasis on the judgment and intuition of the auditor, the focus of the accountant's attention has remained riveted on the factual, technical aspect of his work (18, p. 12).
Therefore, it is not surprising that the effects of bias and prejudice have found little expression in accounting thought (20, p. 73).

Auditing's apparent lack of concern about the role of bias in decision-making and judgment formation would seem to be a serious matter when one considers that the judgment of the auditor permeates his entire production from the designing of the audit program, a detailed outline of the audit work to be performed, down to and including his opinion formed by the audit process (20, p. 73).

A careful examination of generally accepted auditing standards substantiates this prevalence of auditor judgment.

The ten standards as approved by the American Institute of Public Accountants are as follows:

**General Standards:**

1. The examination is to be performed by a person or persons having adequate technical training and proficiency as an auditor.
2. In all matters relating to the assignment, an independence in mental attitude is to be maintained by the auditor or auditors.
3. Due professional care is to be exercised in the performance of the examination and the preparation of the report.

**Standards of Field Work:**

1. The work is to be adequately planned and assistants, if any, are to be properly supervised.
2. There is to be proper study and evaluation of the existing internal control as a basis for reliance thereon and for the determination of the resultant extent of the tests to which auditing procedures are to be restricted.
3. Sufficient competent evidential matter is to be obtained through inspection, observation, inquiries, and confirmations to afford a reasonable basis for an opinion regarding the financial statements under examination.

Standards of Reporting:

1. The report shall state whether the financial statements are presented in accordance with generally accepted accounting principles.
2. The report shall state whether such principles have been consistently observed in the current period in relation to the preceding period.
3. Informative disclosures in the financial statements are to be regarded as reasonably adequate unless otherwise stated in the report.
4. The report shall either contain an expression of opinion regarding the financial statements taken as a whole, or an assertion to the effect that an opinion cannot be expressed. When an overall opinion cannot be expressed, the reasons therefore should be stated. In all cases where an auditor's name is associated with financial statements, the report should contain a clear-cut indication of the character of the auditor's examination, if any, and the degree of responsibility to be taken (2, pp. 81-82).

Adequacy of technical training, independence, due professional care, adequately planned work, proper study and evaluation of internal control, sufficient competent evidential matter and the entire process of reaching an opinion have little definitive bases and all are, in the final analysis, matters of judgment. What one auditor may consider proper or sufficient may not appear so to another. These differences in judgment are the result of personal
attitudes toward certain characteristics, traits, ideas, procedures, concepts, and practices of auditors and auditing (20, p. 74).

Although these auditing standards are basically concerned with the judgment exercised by auditors in their audit examination and report, the influence of personal qualities is considered in only one. The second auditing standard states:

In all matters relating to the assignment, an independence in mental attitude is to be maintained by the auditor or auditors (2, p. 81).

This standard not only requires that the auditor "must be without bias with respect to the client under audit since otherwise he would lack the impartiality necessary for the dependability of his findings" (2, p. 161), but also that he must maintain public confidence which might be impaired "by evidence that independence was actually lacking...[or] by the existence of circumstance which reasonable people might believe likely to influence independence" (2, p. 161). Thus, in this one instance, the personal attitudes of the public as well as of the auditor are taken into account.

The difficult of ascertaining true independence is also stressed because "the possession of intrinsic independence is a matter of personal quality rather than of rules that formulate certain objective tests" (2, p. 162). Personal quality is simply the sum total of an individual's personal attitudes and interests.
One of the personal attitudes of an auditor that would logically seem to have a significant effect upon his judgment is conservatism. This assumption is made because of the specific influence that conservatism is deemed to exert upon decision-making as the following discussion emphasizes.

The underlying factors which appear to characterize conservatism have been documented in various psychological studies—the most important of which have been collected in a book that has become the definitive work in this field (1). These factors are largely interrelated and are considered separable only for the purpose of research and analysis.

Perhaps the most definitive of these interrelated factors is an attachment to the status quo. This attachment to "keeping things as they are" tends to cause opposition to new alternatives and innovations. Thus, "underlying resistance to change is sometimes expressed in the form of an emphasis on caution..." (1, p. 154). Such caution could be manifested as an aversion to risk which is the inference in the research of Kogan and Wallach (13).

In addition, the factors of conservatism play an important role in decision-making because of the obvious fact that many of the forms of psychological activity that we customarily call "thinking" eventuate in some kind of decision-making. Decision-making in turn involves the weighing of alternatives in terms of desirabilities and likelihoods. Issues concerning the avoidance or acceptance of risks in arriving at decisions hence are likely to be important ingredients in thinking processes (18, p. 1).
This brief discussion emphasizes the basic characteristics of conservatism as being resistance to change and aversion to risk and substantiates the influence of avoidance or acceptance of risk on decision-making. Because risk is an integral part of the auditor's function, it is logical to assume that his personal attitude with regard to risk, i.e., his degree of conservatism, would have a significant effect upon his judgment. Especially in view of the observation that the quality of conservatism in auditors springs naturally from the heavy responsibilities that anyone assumes who has to issue the financial statements of a large public firm (18, p. 84).

The degree to which this basic attitude is present in each auditor could vary greatly and, consequently, so could its effect upon the auditor's judgment. For example, the more conservative auditor might be inclined to take significantly more time on both compliance and/or substantive testing because he would require more evidence and investigation in order to feel reasonably secure that the financial statements were presented fairly. On the other hand, a less conservative auditor might be more inclined to accept management's assessments of conditions in the firm and, therefore, only require a minimum of testing and other audit investigation to gain reasonable assurances that the financial statements were fairly presented. Both of these situations are undesirable and, if the above assumptions concerning
the influence of conservatism are true, could lead to serious consequences.

The overly conservative auditor might spend too much time on his audits, resulting in inefficient audits and, thus, excessive costs for both the client and his firm. He may be in conflict with the client in his efforts to influence overly conservative financial statements, which, if he were successful, would be misleading to the users. By contrast, the much less conservative auditor would be prone to cut the time and, therefore, the cost of his audits but could run the risk of overlooking serious errors in the financial reporting of the client. This situation could also produce misleading statements for users and even lead to legal actions against the auditor and his firm.

This example of conservatism as a personal attitude that may affect the auditor's work is just one of many biases that may be applicable. It has been chosen because it is deemed to be particularly influential on the types of decisions that auditors have to make and, thus, on the total performance of his responsibilities.

Scientists have also recognized the problem of personal attitudes and their possible effects, and Brown and Ghiselli suggest these simple steps to reduce bias:

(1) Thoroughly acquaint yourself with all points of view concerning a proposition and particularly those in opposition to your own.
(2) Purposely examine your own thinking for bias and encourage colleagues to be free with criticism.

(3) Refrain from "overworking" the theory that is being championed and refrain from overgeneralization even when heavily supported by empirical findings (7, p. 26).

The best defense against the influence of bias, then, is knowledge of personal biases, self-examination and self-control.

In summary, since bias is universal and "unavoidable in all products of the mind" (6, p. 180), the auditor should accept the fact that he has biases—but how do they affect his work? In the foregoing discussion the effects of one bias—conservatism—have been logically surmised, but have they be surmised correctly? Considering all the possible ways in which bias might affect the auditor's judgment and the evidence, cited herein, that the auditor's judgment permeates his entire production, it is deemed advisable that empirical research be undertaken to define and measure the effects of bias on the judgment of auditors.

Purpose and Scope of the Investigation

Purpose

The purpose of this study is to investigate and document the possible effects of bias on the decision-making of auditors.
Conservatism was chosen as the biasing factor, not only because, as previously stated, it would seem to be especially influential on decision-making, but also because it has been the subject of much research in psychology. There are a number of validated psychological tests (9, p. 26) that measure conservatism on various bases.

In psychological research, in order to measure personality traits or personal attitudes, it is necessary to carefully define the characteristic of the trait or attitude to be tested and then find or generate an instrument that will test precisely the characteristic that has been defined (17, pp. 85-87).

For the purpose of this study, conservatism is defined as "resistance to change" and "aversion to risk," and two of the instruments that have been chosen for data collection specifically measure these two characteristics.

Evidential sample size was chosen because it is a representative decision that auditors, from seniors to managers, make on every audit. It is a basic, but important, decision which can have an effect upon the outcome of the audit, and therefore, upon the auditor's opinion as illustrated in the following discussion.

The overall objective of auditing financial statements is to determine whether the statements are presented fairly
in accordance with generally accepted accounting principles applied on a consistent basis from year to year. The auditor forms an opinion about the statements by accumulating audit evidence as prescribed in the standards of field work. If on the basis of adequate evidence, he reaches a conclusion that the financial statements fairly present the financial position of the firm, he gives an audit opinion to that effect. This audit opinion is part of the auditor's report which accompanies the financial statements. If, however, he believes that the statements are not fairly presented, or he is unable to reach a conclusion on the basis of the audit evidence, he has the responsibility to notify the users in his audit report (4, pp. 18-19).

The client's system of internal control has an important bearing upon the reliability of financial information. The auditor is justified, as indicated in the second field work standard, in using an evaluation of internal controls as a basis for limiting further evidence gathering relating to account balances.

In order to evaluate a system of internal controls, the auditor must determine how the system operates, make a preliminary evaluation as to whether it was designed to accomplish the control objectives and to identify the strengths and weaknesses of the system (4, pp. 20-21).
If, in this evaluation process, the auditor has identified an effective control, or strength, in the system, he is entitled to rely on this control to enhance the reliability of financial information. Hence, he can reduce the extent to which the accuracy of that information must be validated through the accumulation of evidence related directly to it (4, pp. 20-21).

In order to justify this reliance, the auditor must test the validity of his evaluation of internal controls. These tests are commonly referred to as compliance tests.

Compliance tests are audit procedures designed to verify whether the client's controls are being applied in the manner described in the flowchart and internal control questionnaire. If after the tests, the auditor believes the client's controls are operating effectively, he is justified in placing reliance upon the system and thereby reducing the substantive tests (4, p. 192).

Substantive tests "are procedures designed to test for dollar errors directly affecting the fair presentation of financial statement balances" (4, p. 193).

Compliance errors are only indications that dollar errors may have occurred in the financial statements and are material only if they occur often enough to make the auditor believe that dollar errors on the statement may be material. Substantive tests should then be made to determine the extent of dollar errors that have actually occurred.
If the internal control system is not considered effective, no compliance tests may be made. Not testing can be justified because there is no reason to test a system that the auditor considers too inefficient to rely upon.

Even though the auditor's compliance tests substantiate an adequate system of controls, some substantive tests are always necessary because errors are still possible. Thus, substantive sample sizes can be reduced if internal control is evaluated as excellent, but they cannot be eliminated.

Compliance and substantive sample sizes are an important input into the auditing process and are decisions with which all auditors in decision-making positions are familiar. For these reasons, and because they are subject to measurement in a research setting, evidential sample sizes were chosen as the vehicle for decision-making in this experiment.

The null hypothesis to be tested is stated as follows:

\[ H_0: \text{There is no significant relationship between evidential sample-size decisions made by auditors and the degree to which they are conservative or not conservative.} \]

The personality trait of conservatism is different from the accounting concept of conservatism, which holds that where more than one accounting or measurement alternative is permissible for a transaction, the one having the least favorable immediate effect on net income or owner's equity usually should be selected (22, p. 323).
Accountants are taught and trained to employ this concept of conservatism in their practice of accounting; therefore, both conservative and non-conservative accountants would use it. The difference would be in degree. The more conservative accountant would be prone to use the concept more often and understate financial statements to a greater degree than the not-so-conservative accountant because he would be more inclined to accept uncritically traditional practices and would also be more averse to taking the risk that a less conservative approach might entail. This statement can be logically made and supported because

"...bias acts as a selective agent in perception. Consequently, a person will be inclined to develop and retain those [concepts] that agree with his bias and ignore [concepts] in disagreement with the bias despite any truth that they may contain (7, pp. 25-26)."

Scope

The results of testing the null hypothesis will affect additional tests that can be made to provide more knowledge and understanding of the effects of conservatism. For instance, the audit judgment case, which the subjects will use in this study to make sample-size decisions, is concerned with decision-making under three different conditions: strong internal controls, fair internal controls, and weak internal controls. In a previous investigation (15) where decision-making was made under only two of these conditions
--strong and fair--a greater variance was found among sample-size decisions made for the fair system of control than for the strong. One reason for this variability could be that as sample-size decision-making moved from strong internal controls to fair, the risk of possible errors in the accounting information greatly increased, thus activating the "aversion to risk" bias in the subjects which, as the risk becomes greater, would logically result in increasing variance in the sample-size decisions based upon the degree to which the subjects were risk averse. Therefore, if this investigation supports the null hypothesis with regard to the overall results of the auditor's decisions, the sample-size decisions will be separated on the basis of the three conditions under which they were made, and tests will be conducted to see if the effect of the conservative bias is significant when specifically related to the audit judgments made on the basis of fair or weak internal controls. As a matter of fact, this test would be just as valid if the null hypothesis could be rejected, since it would provide useful information concerning the influence of conservatism under different conditions.

In addition, compliance and substantive sample size decisions will be separated and tested to see if the effect of conservatism differs significantly between the two types of decisions and/or in comparison with the combined results
obtained for each condition of internal control. A significant effect could result due to the inverse relationship of compliance and substantive sample-size decision-making, as required under the different evaluation of internal control, so that the aggregation of the sample sizes may have resulted in a loss of variance.

Values to Be Derived from the Findings

If the null hypothesis is accepted, the research will have provided some information about the effect of bias on the decision-making of auditors. Although the information may be that using these particular instruments on these subjects show no significant effect, the research itself may provide a better understanding of the biases and the decision-making of auditors. It may also indicate new methods and areas for future research that could be productive.

If the null hypothesis can be rejected, there are a number of positive benefits that would derive from this study. One of the most important would be to provide enlightenment and mitigating solutions with regard to a problem that has surfaced time and again in research projects that were concerned with auditors’ decision-making. In these studies, researchers were unable to provide explanations for the significant variability in the decisions of
auditors who were all using the same information as a basis for their decisions.

Aly and Duboff (3) collected a judgment sample through the use of a mail questionnaire which was returned by 158 CPA's who were asked to indicate, among other things, the number of accounts to be confirmed using accounts receivable information that was provided. There was substantial variation in the sample sizes, from less than 10 percent to 100 percent. As the range of dollar amount increased, so did the sample sizes, causing the authors to conclude that the respondents "were less willing to take chances with the account balances which individually formed larger portions of the total balance" (3, p. 128).

In an investigation of 88 CPA's, responses to questions concerning prior distributions and sample sizes which were to indicate the feasibility of using Bayesian statistical techniques in auditing, Corless (9) found "considerable variability among the prior distributions assessed by different auditors for each audit case" (9, p. 560) and substantial differences in sample sizes, ranging from 15 to 1,500, with all respondents using the same information.

Because such inconsistency of audit judgment was perceived to be a matter of concern, both Neumann and Ashton addressed this subject in experimental studies.
Neumann's investigation (16) of the consistency in reporting by auditors of a change in accounting methods revealed much inconsistency in the way in which they handled the change. In many instances, auditors in different offices of the same firm followed different policies and, in general, policy differences existed both between and within firms in the industry.

In Ashton's research project (5), the major purpose was "simply to determine the extent of judgment inconsistency in the evaluation of a hypothetical internal control situation" (5, p. 145). As a result of this investigation, Ashton concluded that, although judgment in general exhibited a fairly high level of consistency, "when specific auditors were considered, some inconsistency was found to exist in this relatively simple judgment task" (5, p. 153). Therefore, he suggests that "additional research is needed in order to determine when the judgment of particular auditors are inconsistent" because in his judgment "a prerequisite to the reduction of judgment inconsistency is the recognition of its existence and the identification of its possible reasons" (5, p. 153).

Hofstedt and Hughes in their experimental study (11) of audit decision-making in judging materiality and disclosure found "substantial differences among subjects on several dimensions" (11, p. 389). As a result, they surmised that
...the existence of pervasive and important individual differences cannot be discounted in information processing tasks similar to this one. If one is interested in equity among users of financial statements, judgmental accuracy among accountants, consensus, predictive efficiency of actuarial as opposed to human models, etc., then one must confront the problem of variability across individuals (11, p. 392).

The continued experience in research studies of substantial differences in auditors' judgments and the growing concern about such inconsistencies caused Joyce to undertake a research project (12) with the purpose of "assessing the extent and nature of such differences in judgment" (12, p. 34). Joyce documents the fact that consensus is important to the auditing profession and surmises, from the firm and professional efforts to achieve consensus, that continuing variance in judgments is costly. His study "may be viewed as an assessment of the relative strength of the two sets of opposing factors" (12, p. 37), i.e., substantial variance in auditors' opinions and efforts to decrease such variance. The result of Joyce's investigation was consistent with prior auditing research in that high variance among judgments was found. In view of this result, he concluded that

the overall strength of factors contributing to differences (e.g., individualistic variables, the dynamic and probabilistic audit environment) exceeded the overall strength of factors that (a priori) should reduce differences (e.g., certification standards, continuing education programs) (12, p. 53).
and suggests that "more research into individual differences among auditors' judgment should be conducted..." (12, p. 53).

The research that is the topic of this dissertation speaks directly to the problems of high variance among auditors' judgments since bias is recognized, by both historians and scientists, as being the direct cause of inconsistencies in the opinions of investigators when they are interpreting the same data. If degree of conservatism is found to have a significant effect upon the decision-making of auditors, then the first step will have been taken toward identifying the specific attitudes of auditors that are the major cause of inconsistency in their judgments. Once the reasons for inconsistency have been identified, their reduction can be accomplished because, as previously stated, the best defense against bias is awareness of its existence.

Thus, in the case of conservatism, auditors could be given tests to measure degree of conservatism; and, once they were made aware of the fact that they are more or less conservative than their peers, this knowledge would constantly be in the front of their minds when they were making judgments and would have the effect of mitigating the bias and reducing the variance in judgments among auditors by the adjustments for bias that would be made.
Organization

This dissertation is organized to present a wide overview of the research project in the beginning chapters and to concentrate on the particular details of the investigation in the subsequent chapters.

Chapter I provides the origin of interest in the study along with its purpose and scope. A survey of the related literature in order to provide a summary of relevant prior research and establish the status of accounting research in the field is presented in Chapter II. The research procedures are the subject of Chapter III in which a description of the subjects involved, the test package used for data collection, and the method of administration is provided. Chapter IV is concerned with a presentation of the data collected and an analysis of its import. The purpose of Chapter V is to summarize the pertinent findings which lead to the stated conclusions and suggest further research that might prove, if not constructive, at least illuminating.
CHAPTER BIBLIOGRAPHY


CHAPTER II

THE STATUS OF ACCOUNTING RESEARCH IN THE FIELD

The two areas of research in accounting that have received increasing interest over the last decade are the behavioral aspects of accounting/auditing and the decision-making process of users of financial information, which includes accountants and auditors. Both of these areas are relevant to the proposed study.

Behavioral Research in Auditing

The earliest behavioral research in auditing was undertaken by Neil Churchill who is a pioneer not only in behavioral auditing research but in the use of laboratory and field studies in his experiments. His ongoing research (6, 7, 8) is concerned with the behavioral effects of the audit process on audited personnel. In his experiment with Cooper (7), the subjects were chosen from both industrial personnel who had experienced commercial audits and from college students in industrial management who had no previous experience with audits. These subjects were deliberately chosen to include audit experienced and inexperienced people in the test in order to obtain the desired results. A series of three experimental tasks were
performed which included solving a number of problems correctly, keeping accurate records for the tasks, and following a set of procedures in solving problems. The results of the experiment indicated not only that the actual occurrence of an audit had an effect on those audited, but that the anticipation of an audit also had an effect. This effect experienced by both the audited subjects and those anticipating an audit was to conform toward what they perceived as the auditor's criteria which was usually a comparison of their performance with some organization standard or goal. Churchill's studies were the first to provide insight concerning the extent to which an audit could influence the behavior of the person audited. This research opened the door to numerous other studies concerned with accounting or auditing circumstances which affected behavior.

Neumann's research (18) was one of the first investigations into the judgment of auditors. The purpose of his study was to examine the application of the generally accepted auditing standard of consistency in an effort to ascertain the dimensions of materiality. By using two common accounting changes and examining the financial statements of three hundred companies from the 1964 Fortune 500, Neumann found considerable inconsistency in the handling of the changes. His concern over this lack of consistency moved him to state,
There is considerable discussion among accountants about the necessity of protecting the free exercise of the independent accountant’s professional judgment. But can judgment based on a standard that permits such diverse results be defended? (18, p. 12).

One of the first uses of personality scale in auditing research occurred in Coffman’s investigation (9). The purpose of his research was to discover whether a difference in personality characteristics existed between (1) Big-Eight* auditors and non-Big-Eight auditors, (2) public and private accountants**, (3) practicing accountants and accounting students, and (4) senior accounting students and lower level accounting students. He used the results of a personality inventory (not identified) to ascertain that differences existed in the personality of Big-Eight and non-Big-Eight auditors but that private and public accountants were more alike than different. A large number of differences were found to exist between practicing accountants and accounting students, but few differences were detected between upper and lower class accounting students.

Sorenson, Rhode, and Lawler (19) used an opinion questionnaire to measure and contrast the attitudes of

*The eight largest public accounting firms.

**Public accountants are those working for public accounting firms and private accountants are those working in industry.
partners and staff accountants in Big-Eight firms in order to discover how much difference existed between the loyalties of the two groups. The findings in the present research were compared with past findings. As a result of this research, the authors concluded that partners have shown a growing identification with their profession rather than with their individual firm. However, this tendency is not increasing rapidly enough to close the widening gap between successful practitioners and staff accountants who projected even stronger loyalties to their profession in the present study.

Willis (21) chose the Sixteen Factor Personality Questionnaire and the Job Description Index* to measure personality characteristics and job satisfaction of public accounting firm personnel at various levels from partners to staff accountants. Scores of the partners (the most successful members of the profession) were used as a basis for comparison. Significant differences were found between partners and the other personnel in the firms. These differences were reported to suggest that those who reach the partnership level in public accounting firms have specific personality traits that contribute to their success.

*Descriptions of the various psychological tests noted herein can be found in Buros(4) or in the cited research in which the test was used.
Buelmann's research (3) addressed the problem of high turnover, low job satisfaction, and low performance in public accounting firms. The subjects in his study—thirty audit teams—were administered the Leader Behavior Description Questionnaire to measure leadership styles of the in-charge audit seniors. Job satisfaction was measured with the Porter Scale, turnover was measured by individual perception, and performance by senior and average peer ratings as validated by Lawler's multitrait-multirater method. The reported results indicated that staff accountants on jobs that approached a normal work environment were more satisfied than auditors on jobs with adverse work conditions. However, on these latter audits, the seniors who scored high on consideration (a category on the leadership questionnaire) had substantial influence on reported job satisfaction. The auditors with more job satisfaction also reported decreased turnover perceptions. Further, those who perceived rewards following performance had higher performance measures.

The purpose of the Kochanek and Kochanek study (14) was to analyze and report the agreement between the perception of partners in public accounting firms and that of undergraduate accounting students as to the most desirable personality traits necessary for professional success as an accountant in public accounting. In addition, the Sixteen Personality Factor Test (16PF) was used to investigate the
extent to which a sample of senior accounting students possessed the requisite personality characteristics. The reported results suggest that the personality traits perceived as most important by students were similar to those of the partners. The results reported with regard to the 16PF test of students was that the traits found in the male students related closely to those considered significant by the partners, but the female students possessed personality characteristics identified as critical by the partners. In the authors' view, this could be interpreted to indicate that females inherently possess important personality traits that promote success in the public accounting profession.

All of these research studies have contributed to increased knowledge about and understanding of the auditing environment, the auditing profession, and the auditor. The research that is the topic of this dissertation utilizes this accumulated foundation of research and investigates a heretofore neglected area concerning the effect of personality variables on audit decision makers. Hopefully, it will further contribute to the expanding body of research relating to auditing and auditors.

Behavioral Research in Decision-Making

So many studies have been concerned in recent years with the process by which various individuals and groups make
decisions (1, pp. 55-64) that the subject has evolved into a separate research area known as human information processing. Both human information processing and behavioral research have expanded to the point that an area of overlap has occurred in which researchers have been investigating the different effects of personality on decisions made by subjects using accounting information. It is this area of overlap that specifically relates to this study.

In 1973 Lusk (16) investigated the premise that the process of choosing annual reports as a basis for investment selections "depends upon the cognitive arrangement of the annual report and the field disposition of the user" (16, p. 193). Using the relationship between the psychological surrogate (field independence/dependence) with subjects classified by scores on the Embedded Figures Test and the field dimension of two annual reports: one classified as hi-analytic (field independent) and the other low-analytic (field dependent), Lusk concluded that the form of the annual report did influence investment selections with selection preferences seemingly related to the degree of individual field perception.

This was one of the first research studies in accounting that used psychological instruments to help explain the decisions made by subjects in an investigation and is, therefore, directly related to the research that is the topic of this dissertation.
A later study of Bariff and Lusk surmised that success at the implementation stage of a management information system would partially depend upon the user's (1) resistance to change, (2) propensity to utilize ego defenses, and (3) stress level. If given measurements for these psychological attributes, the systems analyst could act to minimize resistance to change and user anxiety. A battery of ten psychological instruments was used to measure the three categories of behavior and cognitive style. These instruments provided considerable insight for the systems analyst. The cognitive style measurement provided information as to the kind and frequency of reports needed for this subject group. In the first behavioral category the research found that individuals who were less flexible (as reflected by their scores on the resistance to change instrument) would need more time and attention during the design and implementation of the system. Another behavioral conclusion was that those who exhibited a higher than average stress level should be given more frequent progress reports to aid in decreasing anxiety. The defense mechanism scores were such that no special procedures were needed to minimize impact in this area.

The investigators used psychological tests in a very beneficial and useful manner, e.g., to aid in understanding
the personality types and to indicate the best way to proceed in order to accomplish a projected goal in the most harmonious and efficient manner. Psychological instruments will be put to a different but also productive use in the research that is the topic of this dissertation, i.e., to further the understanding of the decision-making of auditors and to indicate whether selected personal attitudes have an effect upon those decisions.

Hofstedt and Hughes (12) investigated the information handling attributes of accountants as expert decision-makers in judging materiality and disclosure using the research tradition referred to as "clinical judgment." The two classes of independent variables were (1) three numerical parameters presumed to be materiality indicators which were controlled explicitly within the experimental design and (2) two behavioral measures assumed to be related to the subject's propensity to disclose and risk-taking propensity. The measure for propensity to disclose was produced by the experiment. Subjects were asked in an average writeoff situation (not explained) to assess their probability of disclosure. The risk-taking propensity was measured with Kogan and Wallach's Choice Dilemmas Procedure. However, this measure was excluded from analysis of the results for two reasons. First, "there was little difference between subjects" (12, p. 384). Choice Dilemmas was also utilized
in the research that is the topic of this dissertation; however, contrary to Hofstedt and Hughes' experience, substantial differences between subjects were found (as discussed in Chapter IV). The second reason Hofstedt and Hughes excluded the Hogan and Wallach measure was because "the dimensionality of the measuring device is not clear" (12, p. 384). This conclusion was based on an article by Cartwright (5) in which he criticized the Choice Dilemmas as being a measure of utility rather than risk. This controversy has not as yet been resolved, but the instrument has continued in use as a risk-taking measure (15, 20). In addition, if Hofstedt and Hughes had been seriously concerned about the dimensionality of the measuring instrument, they would not have used it to test the subjects as they did.

The reported conclusions of Hofstedt and Hughes were that pervasive and important individual differences existed in the judgment of the subjects and that their cognitive and analytical skills were limited. Therefore, the authors suggested remedial or compensating mechanisms as an aid to decision-making and as a method of decreasing the wide dispersion of judgments among auditors.

With this research, Hofstedt and Hughes documented the wide variance in the judgment of auditors, expressed their concern with this inconsistency of judgment (as quoted in
Chapter II), and reached conclusions that suggest a useful way of mitigating this problem. The research that is the topic of this dissertation is oriented not only toward finding a way to mitigate inconsistencies in auditors' judgments, but also toward explaining why they exist.

Another research study concerned with cognition was performed by Dermer (10). In his examination of cognitive characteristics and the perceived importance of information, he used subjects who were middle managers in sales for a large integrated oil company. The subjects were asked to sort a card deck of 72 job aspects using the criterion of how important the items would be to them if they were performing the manager's job as they believed it should be performed. They were then given the Budner's test of ambiguity, and these scores were correlated with the scores from their card deck selections. The strongest relationship that resulted from these correlations was a negative relationship between ambiguity tolerance and the amount of information perceived to be important. There was no significant effect between ambiguity tolerance and types of information perceived to be important. However, it was found that subjects who are intolerant of ambiguity ranked current internal financial information as most important and that the uncertainty or chance of misinterpretation inherent
in information concerning future events and behavioral data (such as motivation, customer satisfaction, etc.) does affect the importance attached to these types of information. Thus, the results of this study would be useful to accountants in their efforts to produce financial statements that more closely fit the needs of the users. While Dermer's research does not directly relate to the present experiment, it does illustrate the usefulness of behavioral research in decision-making.

Driver and Mock (11) used Driver's Decision Style Theory to investigate the differences in information purchase behavior and decision speed based on a business game modeled after a manufacturing concern. The game required marketing and production decisions which provided the data for the experiment. The experimental results indicated that, given the complex structured tasks of this experiment, the five decision makers defined by Driver's test had different ways of using and processing data such that

1. Complex decision makers prefer (re their purchase behavior) and effectively use more complete feedback.

2. Integrative decision makers prefer less complete feedback but use moderate initial data to formulate effective long-range plans (in more unstructured tasks, the Integrative seem to prefer more constant data input.).

3. Hierarchic decision makers prefer and effectively use moderately complete feedback.
4. Flexible decision makers prefer but are somewhat less able to use effectively moderately complex feedback.

5. Decisive decision makers become rapidly overloaded in complex structural tasks and hence cannot effectively use complex feedback (11, p. 507).

These results are useful not only to accountants in considering the information needs of users, but also to researchers who generate instruments for their experiments. Knowledge of the information needs of subjects and the way in which they may use the data could provide assistance in designing research tools that would provide more valid data for experimental use.

McGhee, Shields, and Birnberg (17) designed an experiment to assess the importance of two personality variables: tolerance for ambiguity and decision style, on subjects' use of information in an investment-type decision. In order to classify subjects according to the personality characteristics, Budner's Intolerance of Ambiguity Test and Driver's Integrative Style Test were administered. The conclusion reached was "that personality alone does not account for much of the variance in a decision-maker's behavior" (17, p. 696).

According to the authors, the results of this experiment "provided little support for the notion that personality variables explain a significant portion of the variance in human information processing behavior" (17, p. 692), and
they go on to support this finding with references to other research. Their conclusions have indeed been substantiated by the results of other research when personality variables have been used in a general sense to explain how individuals process information. However, when personality variables have been used to study specific decisions in which they would logically have an affect, positive and useful results have been obtained (2, 10, 11, 12, 16). Because conservatism would logically affect sample-size decisions under various conditions of uncertainty and risk, the use of personality variables in the research that is the topic of this dissertation should produce positive results.

As can be seen from these experimental studies, the effect of personality variables on decision-making is largely inconclusive with indication in some cases of positive effect and in others of little or no effect. Thus, more research is needed to clarify the role personality characteristics play in the decision-making process.

Although behavioral research in accounting is still in an early stage of development, it is beginning to attract the attention of more researchers in accounting as well as their counterparts in the behavioral and social sciences (13, p. 41). This increased interest will undoubtedly greatly expand the depth and breadth of research in the entire area of behavioral research in accounting and,
hopefully, in the specific area of investigation into the different effects of personality on decision-making. Behavioral research in decision-making in an accounting environment is still quite limited as reflected by the studies cited in this section.


CHAPTER III

DESCRIPTION OF THE RESEARCH PROCEDURE

This research project began with the choice of two opinion questionnaires and the design of an audit judgment case, all of which were to be administered to auditors working for local public accounting firms. A pilot study of 156 students at North Texas State University was conducted to test the instruments. On the basis of feedback from this pilot study, minor adjustments were made to the case. The dissertation proposal was presented to the faculty and graduate students at North Texas State University and was extensively critiqued. On the basis of the suggestions made at the defense, the audit judgment case underwent further major revisions and was finally ready to be administered to the subjects chosen to participate in the experiment.

In order to test the theory that conservatism affects the decisions made by auditors, it was necessary to collect data from subjects who were not only actively participating in auditing, but also involved in the decision-making process of the audits to which they were assigned. Therefore, auditors with at least the rank of senior and two years experience were desired.
The plan for collecting data was to gather the subjects together in small groups and have the test administered by the investigator. This plan was adapted in order to avoid the problems and criticisms that have resulted from the use of mailed test materials (17, 7, 9, 16, 8, 15).

In multiple correlation and regression (the planned method of evaluation), as in most psychological measurement, nothing benefits the research more than having a large sample of subjects. The number of independent variables dictates the size of the sample in that 9 or 10 independent variables will require 300 to 400 subjects to prevent bias; but, "if there are only 2 or 3 independent variables and no pre-selection is made among them, 100 or more subjects will provide a multiple correlation with little bias" (14, p. 164).

In order to get 100 or more subjects of the type desired and to fulfill the objective of personal interview data collection, the logical source of subjects was the large national accounting firms in Dallas.

This chapter is organized to follow the research design. The next section provides in-depth information as to how the subjects were chosen and why the methods used are deemed to have produced a random sample. The following two sections discuss the two psychological instruments that were selected and provide background information as well as reliability coefficients and evidence of validity. The last section
describes the administration of the research instrument and the logic behind the choice of this method.

Subjects Used in the Experiment

Nine firms, the "Big-Eight" and one other large national accounting firm, participated in the experiment. The research instruments were administered at prescheduled training sessions at a pre-arranged hour, usually at the beginning of the session. The subjects were not aware that they were participating in a research experiment until the investigator was introduced by a member of the firm, i.e., a partner, manager, training director, or seminar leader. At each session, the subjects were told that the Big-Eight firms were participating in the research and that their cooperation and conscientious effort was essential for the research to be valid.

Although the dates and times for administration of the research instrument were chosen by the members of the firms, the subjects who participated were chosen in an essentially random way in the following manner.

The number of hours of continuing education suggested for accountants in Texas by the State Board is forty hours a year and, although there is no strict requirement to fulfill this number of hours, the accounting firms make every effort to do so. Those firms that handle their own training sessions
on a local area basis separate their accountants by specialty and rank. The members in each of these classifications are then assigned to training sessions in small groups of 12 to 15. Training is accomplished mainly during late spring and summer, the auditors' slow season. These training assignments are flexible and based upon availability. However, careful records of the hours of continuing education are kept and each accountant is required to fulfill his quota of forty hours each year.* Thus, the firm's selection of time and date for a specific training session in which to administer the research instruments was, in essence, a random selection of the subjects that had been previously assigned to that particular session out of the total population of auditors in that classification.

For those firms whose training sessions are controlled from the home office (standard syllabus, instruction, and time schedules), the mode of selection was to circulate an inter-office memorandum requesting that all the auditors from the rank of senior through manager who would be available on the date and at the time specified, meet for a training session. Those who were available that day and time were essentially a random sample of all those within

*Based on a conversation with the training director of Firm #3 who indicated this basic system of continuing education pertained to all the firms.
the designated ranks. They met in a conference room and the research instruments were administered. In every case, whether in prescheduled training sessions or in-house sessions, the participants did not know before they arrived that they were to be research subjects.

In the groups selected by both methods, it became apparent that some auditors with a rank of senior had less than the desired two year's experience. Although these auditors did not specifically meet the desired requirements for years of experience, they were included on the basis that partners in their firms had specific knowledge of their decision-making ability and considered them competent in that function. In addition, the number of these cases was so small (7) in comparison with the total sample, their inclusion was deemed to have no material effect on the results of the experiment.

The ranks of the 116 subjects (90 males and 26 females) used in the experiment ranged from semi-senior to manager with audit experience ranging from under 2 years to 24 years (Table II). The mean experience level was 3.8 with a standard deviation of 2.93. The firms participated in the experiment in the order listed in Tables I and II.

There was considerable variance in the mean level of experience across firms, from a low of 1.54 to a high of 8.19. This difference is largely due to the two methods of
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*One respondent did not fill out demographic information.

**Two respondents did not fill out demographic information.
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* One respondent did not fill out demographic information.

** Two respondents did not fill out demographic information.
selecting subjects. Administration of the research instruments at a previously scheduled regular training session usually resulted in the subjects being seniors who had considerably less experience than the supervisors and managers who usually participated in the groups selected on an availability basis.

This mix is due to the work patterns of public accounting firms. Seniors and below spend most of their time in the client's office (the field) providing on-site supervision, while the supervisors and managers remain more in the office planning the audits, reviewing work papers, and supervising several seniors.

Research Instruments Administered to Collect Data

Psychological research which involves the measurement of a construct (a variable that is abstract rather than concrete) requires careful operational definitions of the constructs involved and the use of an instrument that specifically measures that which has been defined (14, p. 85-87).

In this research the constructs of conservatism are defined as "resistance to change" and "aversion to risk." The psychological instruments that have been chosen to measure these two constructs are the Wilson and Patterson Conservatism Scale (26) and the Kogan and Wallach Choice Dilemmas Procedure (11).
Wilson and Patterson Conservatism Scale

A variable of personality which has been shown to have considerable predictive value in both social and clinical psychology is that which is variously labeled authoritarianism, dogmatism, fascism, and anti-scientific attitude. The term "conservatism" is preferred because it is less value-toned than other alternatives (26, p. 264).

This scale (see Appendix for Opinion Questionnaire I) was developed through the use of 132 items that were chosen as discriminators of the following characteristics that are expected with extreme conservatism:

(a) Religious fundamentalism.
(b) Right wing political orientation.
(c) Insistance on strict rules and punishment.
(d) Intolerance of minority groups.
(e) Preference for conventional art, clothing, and institutions.
(f) Anti-hedonistic outlook.
(g) Superstitious resistance to science (26, p. 265).

After three item analyses, 50 dichotomous items were chosen. The odd-numbered items test the subject's acceptance of established, traditional concepts; and the even-numbered items test their acceptance of new, controversial concepts. This scale, then, measures the defined conservatism characteristic of "resistance to change." Thus, the more "yes" answers to odd-numbered items, and the more "no" answers to even-numbered items, the more conservative the subject.

A "?" category was included in the scale to avoid the frustration sometimes experienced by respondents when asked to make dichotomous choices. This category was scored "1"
and each "yes" to an odd-numbered item, and "no" to an even-numbered item was scored "2." Thus, the possible range of scores was from 0 to 100.

This instrument has a reliability using split-half corrected by the Spearman-Brown Prophecy Formula of 0.943 (26, p. 267). This high reliability coefficient was one of the prime reasons for choosing this scale.

Validity was established using the "known groups" validation technique in which two groups who are widely recognized as being at the opposite ends of the construct under study are administered the scale to see if it can successfully identify the members of each group (25, p. 267). In this case the conservatism scale successfully identified the subjects of the conservative group by their high scores and vice versa. This scale has been previously used in three applications (27, 6, 4).

Since both Wilson and Patterson were working in New Zealand at the time the scale was generated, around 1967, it was standardized with subjects from the Christchurch area. The validation and reliability for the test were produced from data collected from these subjects (26, p. 266). For this reason, several of the phrases on the scale did not relate to American customs and traditions, were no longer timely, or were British expressions that would likely be confusing to Americans.
A total of ten items were replaced for this research with concepts that were more relevant to American tradition and/or more current. Four items were simply restated from British expressions, e.g., segregation for apartheid, school spanking for birching.

It is permissible to alter a psychological test in this manner as long as the reliability of the changed test is provided.*

For this purpose, among others, a pilot study of 156 college students was conducted at North Texas State University, of which 154 were valid and used to produce a Cronbach alpha reliability coefficient of 0.74. The loss of reliability could have occurred for a number of reasons. It could be due to the changing of the items or to the subjects being Americans with a markedly different outlook and tradition than New Zealanders who are British subjects raised in the tradition of royalty and empire or to both. In general, when tests are given to subjects other than those on whom the reliability was computed, there is nearly always a change due to the different make-up of the new group.*

This reliability coefficient is significant at the .01 level, but it is lower than desired for reliability

*This information is based on a discussion with Dr. Douglas Johnson, Psychology Department, North Texas State University.
coefficients which are usually in the .80's or .90's (2, p. 109. For research purposes, however, it is certainly acceptable.

As noted, the original version of this test had a reliability of 0.943. However, only 244 subjects were used to produce the coefficient out of a total of 496 respondents. This curious circumstance is not explained by Wilson and Patterson.

Another problem surfaced with this scale when the first group of actual tests was scored. The scale had been retyped before it was given to the auditor subjects in order to make it easier to read and score. In the process, item #39 was inadvertently left off, leaving the scale with 24 odd-numbered items as opposed to 25 even-numbered. Since 0 and 2 are the prime scores on the scale, it was decided that scoring a "1" for item #39 on each test would not affect the test score as a whole and would leave the overall score on each test only one point off no matter how #39 would have been scored.

In a few cases, subjects inadvertently missed an item or deliberately scored two or all three answers. In these few cases, a "1" was also scored for the missed or invalid answer.

Kogan and Wallach Choice Dilemmas Procedure

The Choice Dilemmas Procedure (see Appendix for Opinion Questionnaire II) consists of twelve situations in which a
central person, who changes with each situation, must choose between two alternatives---one is more desirable than the other, but the probability of attaining or achieving the desirable alternative is smaller than the probability of attaining or achieving the less desirable one. Subjects are asked to indicate the minimum odds they would demand before recommending to the central person that the more desirable alternative be chosen. The higher the minimum probabilities chosen, the higher the score and the greater the subjects' conservatism. This instrument measures the risk-taking propensity of the subjects and thus the characteristic of conservatism defined as "aversion to risk."

The reliability of this instrument is based upon several Kogan and Wallach research projects (20, 21, 10) which yielded split-half Spearman-Brown reliability coefficients ranging from 0.53 to 0.80 for various age and sex samples. However, using test-retest in another study (22) produced reliability coefficients of 0.78 for males and 0.82 for females. All of these reliability coefficients are considered by the authors to be satisfactory for a 12-item test.

The instrument's validity as a risk-taking measure is evidenced by the observation that the degree of conservatism measured increases with age for both males and females. This relationship is included in the construct of conservatism.
and may be taken as evidence for the validity of the instrument. The Choice Dilemmas Procedure has been used in many applications of which twelve have been cited (20, 21, 10, 22, 11, 12, 23, 13, 24, 19, 25, 18).

One of the major reasons that the Kogan and Wallach instrument was chosen for this research was its seemingly broad acceptance in psychological research as a risk-taking measure. Not only has it been widely used in risk-taking research, as indicated by the applications cited above, but this scale is the basis for what has become a major paradigm in psychology, the risky-shift paradigm, which maintains that groups make riskier decisions than individuals (5, p. 361). Therefore, based upon the prominent use of this test in psychological risk-taking research, the instrument was deemed valid and useful in spite of rather sketchy information about reliability coefficients that, in some instances, are rather low.

Audit Judgment Case

The most difficult part of this experiment was generating the audit judgment case. From the beginning, there were two basic factors that caused a dilemma: (1) drafting an instrument with external validity and at the same time (2) drafting an instrument to override "firm effects" (specific policies of the different accounting firms) in the decision-making of the auditor subjects. These two
factors are, essentially, mutually exclusive since the more closely the case resembles an actual audit, the more the firm effects will take over the auditor's decision-making. Therefore, unless the device for decision-making could get past the firm effects to the auditor's basic judgment, the case would, in essence, be measuring the firm's judgment with the sample-size decisions rather than the auditor's. The implications for the research can be readily seen if, in fact, the two psychological instruments are measuring the auditor's personal conservatism while the audit judgment case is, in essence, measuring the firm's decision-making. If this were, indeed, the situation, the experimental results would be invalid for the purpose of testing the null hypothesis.

For this reason, a statistical test was made to see if there was a significant difference between the firms based upon the sample-size decisions made by the auditors of each firm. The results of this test are reported in Chapter IV.

In addition, nine firms participated in the experiment and, since each firm has its own often unique approach to auditing, it would be highly unlikely that any one audit case could be designed to fit all nine modes of auditing operations.

Another consideration is the difference with which academicians and practitioners view auditing. Most
auditing books are written by academicians so that if an audit case were generated using the academic audit approach in a specific audit area, it will certainly reflect the academic point of view and be in some part unrelated to the practitioner's idea of how an audit of that specific area would actually be conducted. Consulting with practitioners would not be likely to provide much assistance since those one chooses to talk with would be largely reflective of their particular firm's view of the proper way to audit the area. These views would not likely relate to the other firms who were involved in the research.

In an effort to solve these problems, a rather broad, basic, textbook approach to auditing was taken, using the Arens and Loebbecke book (3) as a guide. Since this book was written by an accounting professor and a partner in a Big-Eight firm, it was hoped that some middle-road had been taken in the auditing procedures to which practitioners could more easily relate.

The conditions of the case itself (see Appendix for Audit Judgment Case) were designed to help mitigate firm effects. The subjects were to perceive themselves as working for a given fictitious national public accounting firm, Graham and Grant (G & G), whose auditing philosophy concerning compliance and substantive testing was set out in the case. The conditions of internal control in the
revenue cycle of three clients of G & G were given through narrative, flowcharts, lists of strengths and weaknesses, and the audit manager's evaluation. The subjects were asked to make sample-size decisions based upon the descriptive material; audit manager's evaluation of internal control as strong, fair, or weak; and information concerning G & G's method of handling this type of audit.

All of this information was provided in order to have each subject make decisions from, as nearly as possible, the same point of view about the described situation. Another aim was to get them to superimpose the case firm's philosophy of auditing in the revenue cycle over their own firm's method in an effort to force them out of a conditioned response into a personal decision-making mode.

The subjects were told that the audit program of testing the revenue cycle for the three clients as provided in the case was only a partial program (a list of audit procedures to be followed) so that any different or additional procedures that might be used in their firm, but not provided for in the case, could be accounted for as being a part of the audit program which was not given.

The first version of the audit case was tested in a pilot study of 156 accounting students at North Texas State University. The purpose of this test was fourfold:
1. to obtain a large sample of test scores on the altered Wilson and Patterson instrument in order to obtain a reliability coefficient for the changed Conservatism Scale,

2. to ascertain the amount of time needed to complete all the research instruments,

3. to get test scores to use in setting up the computer programs for test runs of statistical tools, and

4. to get feedback from the students about the audit judgment case so as to modify the design of the case if necessary.

All of the objectives of the pilot study were achieved, and minor adjustments to the audit judgment case were made as a result of the comments made by the students.

After the instruments were pilot tested and revised, the dissertation proposal was written and presented to the faculty and graduate students at North Texas. The proposal was critiqued extensively, particularly the audit judgment case, and a number of constructive suggestions were made.

The proposal was also presented at three universities during interviews and was again critiqued.

On the basis of all the suggestions that had been forthcoming, a major revision of the case was made. Information for risk evaluation of the three new client firms
were provided, flowcharts of the internal control systems were added along with a list of strengths and weaknesses for each client.

Shortly after the final case revision, appointments were made with the participating public accounting firms and data collection began.

Administration of the Experiment

The random sample of auditors who participated in the experiment met in small groups on a date and at a time and place designated for the data collection. On five different occasions the research instrument was given during training sessions—twice to Firm #3 in order to get a more representative number of auditors from that firm in the research. The research instruments were administered to the five remaining firms on an availability basis in the conference rooms of those firms. The data collection extended from May 21 to June 25, 1979.

In all firms the investigator explained the research task to be undertaken—the instruments involved, the order in which they were to be completed, and the attitude to be maintained throughout the experiment. The subjects were cautioned that they might disagree with some of the audit plans and procedures in the case, but to imagine themselves as working for G & G and to make their judgments in each
situation on the basis of G & G's firm policies as given in the case. They were also advised to assume that compliance testing supported the audit manager's evaluation of internal control in each case in order to make their decisions about sample sizes for substantive testing.

Then, the subjects were asked to fill in all blanks in the audit judgment case with numbers (sample sizes) that were directly related to the information in the case. They were also informed that the demographic information that was included at the end of the case was a necessary part of the research and would be kept strictly confidential.

The instructions for the two opinion questionnaires were self-contained and self-explanatory. The subjects were told to simply score their first reaction to each question with a minimum of analysis.

The audit judgment case was administered first in order to prevent the subjects from getting an inkling of the purpose of the research which might have happened had they completed the two opinion questionnaires first. In that case, their decisions could have, perhaps quite unknowingly, been biased.

The test package of research instruments was contained in two envelopes marked #1 and #2. The audit judgment case was in #1 and the two opinion questionnaires in #2. A test package was distributed to each with the instruction
to open #1 first and, when it was completed, to put it back in the envelope and open #2. Upon completion of the two opinion questionnaires and their return to #2 envelope, the experimental task was finished. The time taken to complete the task was from 30 to 55 minutes.

On all but one occasion, the survey material was completed and collected after instructions were given and the test packages distributed. Due to time constraints, the only way Firm #1 would cooperate was as follows. When the instructions were given and envelope #1 distributed, the subjects took it with them to be completed later. Upon completion, envelope #1 was to be returned to a designated secretary in the firm who would match their number with the same number on a #2 envelope and give it to them to be completed and returned to her. When all the test packages had been returned, they were collected by the investigator.

All the weaknesses of mailed questionnaires except non-response could apply to the results from Firm #1. There is no way of knowing whether one or more decisions were reached in collusion with others; whether the instruments were completed in the correct order; under what conditions the research instruments were completed; or what the subject's frame of mind might have been. If enough time had elapsed from the date the subject received the #1 envelope until the date it was completed, it is likely that all or most of
the instructions had been forgotten. Despite these weaknesses, however, since only 11 cases out of 116 were involved, no material effect upon the experimental results is anticipated.

Consideration was given to statistically evaluating whether a significant difference existed for the eleven subjects from Firm #1 due to the different testing mode. However, it was deemed impossible to statistically separate the different testing method from the firm bias effect. The effect of firm bias was evaluated for each firm as reported in Chapter IV.

The last of the scheduled meetings for administration of the research instruments occurred on June 25. On the same date the eleven sets of instruments from Firm #1 had been completed and turned in.

In summary, the research involved testing 116 practicing auditors in large public accounting firms in Dallas for the impact of personal conservatism on audit decisions. Conservatism was defined as resistance to change and aversion to risk. Two psychological instruments whose validity had been established in past research, were used to measure conservatism—the Wilson and Patterson Conservatism Scale and the Kogan and Wallach Choice Dilemmas Procedure. An audit case was designed and pilot tested to provide an unbiased, familiar environment in which the subjects were
required to make decisions. The test instruments were administered in as controlled a setting as was possible, given the various public accounting firms training and operating practices. All the research problems encountered and the recognized deficiencies of the research instruments and testing procedures have been defined. These problems and deficiencies were analyzed, and it was determined that the validity of the data collected had not been impaired. The following chapter contains the analysis of the results of the testing.
CHAPTER BIBLIOGRAPHY


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CHAPTER IV

PRESENTATION AND ANALYSIS OF DATA

In this chapter the data generated by the research instruments are presented with the objective of providing a clear and understandable impression of both the independent and dependent variables. The distributions and statistical analyses for these variables are displayed in tables, analyzed, and reported in terms of the sample group and the population as a whole.

Multiple correlation and regression is the statistical method most often used in research that is testing the relationship of a dependent variable with several independent variables (6, p. 425). It was also the method originally selected to evaluate this experiment. After the correlations had been run, however, the investigator discovered that the dependent variable did not assume normality, a necessary requirement in using multiple correlation and regression analysis. For this reason, rank order analysis using both Spearman's (rho) and Kendall's (tau) rank correlation coefficients was utilized. The variables meet the requirement for rank order analysis use and "the Spearman's $r_s$ and the Kendall's...($\tau$) are equally powerful in rejecting $H_0$" (7, p. 223).
The Statistical Package for the Social Sciences (5) was utilized to generate the various statistical measures presented in this chapter on analysis of the data collected in the experiment.

Wilson and Patterson Conservatism Scale

As previously stated, one odd-numbered item #39 was inadvertently left out of the Wilson and Patterson Conservatism Scale (W & P) and was scored as "1" on each test. The rest of the scale was scored as follows

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>?</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Odd-Numbered</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Even-Numbered</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

Due to the omission and the way it was scored, the possible scores on this instrument ranged from 1 to 99, rather than from 0 to 100 as would be the case with the complete 50-item scale. The scores for each subject were used as an independent variable in the rank order analysis which is explained later in the chapter.

A simple average of the total possible score on this scale, a score of 49, was considered the neutral point in the scale. Movement to a score above the neutral point would indicate increasing conservatism; whereas movement to scores below neutral point indicate decreasing conservatism. The test scores for the subjects completing W & P ranged from 30 to 78 with the mode being 49 and 53.
The subjects were divided into three groups at 49, the simple average of the test scores. Those with scores above 49 were classified as "high conservatism" and those with scores below were classified as "low conservatism." Using this classification, the distribution of scores was as follows:

<table>
<thead>
<tr>
<th>Test Scores</th>
<th>Subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low conservatism</td>
<td>30-48</td>
</tr>
<tr>
<td>Neutral point</td>
<td>49</td>
</tr>
<tr>
<td>High conservatism</td>
<td>50-78</td>
</tr>
</tbody>
</table>

This distribution indicates that the subjects in the experiment are a heterogeneous group on the construct of resistance to change as measured by the Wilson and Patterson Conservatism Scale; although, as a group, they have a tendency toward conservatism.

A statistical analysis of the test scores on W & P produced the following:

<table>
<thead>
<tr>
<th>Mean</th>
<th>S.D.*</th>
<th>S.E.**</th>
</tr>
</thead>
<tbody>
<tr>
<td>52.512</td>
<td>11.223</td>
<td>1.042</td>
</tr>
</tbody>
</table>

* Standard deviation
** Standard error

The frequency distribution using intervals of 5 is presented in Table III on the following page.

This distribution describes a slightly skewed curve with kurtosis of 0.539 and skewness of 0.198. With this
### TABLE III

**FREQUENCY DISTRIBUTION**  
**WILSON AND PATTERSON CONSERVATISM SCALE**

<table>
<thead>
<tr>
<th>Score</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>75-79</td>
<td>4</td>
</tr>
<tr>
<td>70-74</td>
<td>6</td>
</tr>
<tr>
<td>65-69</td>
<td>10</td>
</tr>
<tr>
<td>60-64</td>
<td>12</td>
</tr>
<tr>
<td>55-59</td>
<td>13</td>
</tr>
<tr>
<td>50-54</td>
<td>20</td>
</tr>
<tr>
<td>45-49</td>
<td>24</td>
</tr>
<tr>
<td>40-44</td>
<td>11</td>
</tr>
<tr>
<td>35-39</td>
<td>11</td>
</tr>
<tr>
<td>30-34</td>
<td>4</td>
</tr>
</tbody>
</table>

distribution, the requirement for normality in the use of many statistical methods has been met.

A Chronbach alpha reliability coefficient of 0.77 was produced by the test scores on W & P which reflects more reliability with these subjects than was obtained with the students in the pilot study (0.74).

**Kogan and Wallach Choice Dilemmas Procedure**

The Choice Dilemmas (K & W) contains 12 items which can be scored either 1, 3, 5, 7, 9, or 11. Thus, the possible range of scores is from 12 to 132. The scores for each subject was used as an independent variable in the rank order analysis explained later in this chapter.
The simple average of the possible scores of K & W is 60 which is considered the neutral point with higher scores reflecting more conservatism and lower scores less conservatism.

The test scores of the subjects on the Choice Dilemmas ranged from 40 to 98 with the mode being the score of 82.

Splitting the sample at the simple average of 60, the distribution of scores was

<table>
<thead>
<tr>
<th>Test Scores</th>
<th>Subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low conservatism 40-58</td>
<td>30</td>
</tr>
<tr>
<td>Neutral point 60</td>
<td>3</td>
</tr>
<tr>
<td>High conservatism 62-98</td>
<td>83</td>
</tr>
</tbody>
</table>

On the construct of aversion to risk as measured by the Kogan and Wallach Choice Dilemmas Procedure, it would seem that the subjects in the experiment are a less heterogeneous group with regard to risk taking and have a distinct tendency toward conservatism.

A statistical analysis of the test scores on the Choice Dilemmas is as follows

<table>
<thead>
<tr>
<th>Mean</th>
<th>S.D.</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>69.198</td>
<td>13.632</td>
<td>1.266</td>
</tr>
</tbody>
</table>

The frequency distribution using intervals of 10 is presented in Table IV on the following page. The curve produced by this distribution is essentially normal with very slight skewness of -0.053 and kurtosis, -0.717.
Audit Judgment Case

The sample-size decisions on the audit judgment case were accumulated in various sets in order to answer different questions about the relationships between this dependent variable and the independent variables, i.e., scores on the two psychological instruments.

The scores were accumulated in twelve different, but related, ways as follows:

Sample size decisions on the case as a whole--
Total sample sizes
  Compliance sample sizes
  Substantive sample sizes

Sample-size decisions for the client with strong internal control--
Total sample sizes (strong client)
  Compliance sample sizes
  Substantive sample sizes

Sample-size decisions for the client with fair internal control--
Total sample sizes (fair client)
  Compliance sample sizes
  Substantive sample sizes

---

TABLE IV
FREQUENCY DISTRIBUTION
KOGAN AND WALLACH CHOICE DILEMMAS PROCEDURE

<table>
<thead>
<tr>
<th>Score</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>90-99</td>
<td>9</td>
</tr>
<tr>
<td>80-89</td>
<td>23</td>
</tr>
<tr>
<td>70-79</td>
<td>26</td>
</tr>
<tr>
<td>60-69</td>
<td>28</td>
</tr>
<tr>
<td>50-59</td>
<td>21</td>
</tr>
<tr>
<td>40-49</td>
<td>9</td>
</tr>
</tbody>
</table>
Sample-size decisions for the client with weak internal control—

Total sample sizes (weak client)
  Compliance sample sizes
  Substantive sample sizes

The decision to make these specific accumulations of sample sizes was based upon the design of the audit judgment case and some expectations derived from other research, which is described in the following discussion.

In the audit judgment case, three situations (three clients of G & G) were presented. The three client companies were similar in general except for the reliability of their internal control systems. The subjects acting as senior auditors in charge of auditing the revenue cycle on these three audits are asked to make sample-size decisions for compliance and substantive testing.

The basis for making such decisions are presented in the case as follows:

The firm policy of Graham and Grant with regard to internal control requires that the manager of each audit determine the relative strength or weakness of internal controls in relevant accounting areas from an internal control questionnaire. The manager gives this information, along with general guidelines and a flowchart, to the senior auditors assigned to audit the different areas. These auditors are then required to use the manager’s assessment of internal controls in their area as the basis for a preliminary plan in which they decide the initial extent of compliance and/or substantive testing.
The general guidelines for the reliance of G & G auditors on the assessment of internal controls are:

- **Strong**—place significant reliance on controls.
- **Fair**—place some reliance on controls.
- **Weak**—place little reliance on controls.

In addition, the G & G firm manual states with regard to compliance and/or substantive testing:

As more reliance is placed upon internal controls in relevant audit areas, more compliance tests are needed to verify the assessed strength of internal controls and less substantive tests are required. However, as less reliance can be placed upon internal controls, less compliance tests are needed and more substantive tests are required (see Appendix for complete audit case).

Official auditing guidelines as pronounced in "Statement on Auditing Standards No. 1" require the use of internal control evaluations as a basis for planning the amount of testing (1, Au 320). However, research has cast some doubt upon the extent to which this concept is used in practice (4, 2). For this reason, it was surmised that some auditor subjects might choose sample sizes on the basis of internal control evaluations as instructed, while others might not. Those using the case instructions on evaluation of internal controls would choose larger compliance samples for the client with strong internal control and smaller substantive samples; for the client with weak internal controls, however, small to zero compliance samples would be chosen and larger substantive samples. On the other hand, those subjects not
using internal control evaluations would not increase compliance sample sizes and reduce substantive sample sizes on the basis of strong evaluations but would be prone to use some other sample size established by firm policy or personal judgment. In an effort to mitigate the effect of such an occurrence which would have the tendency to confound the experimental results, compliance and substantive sample sizes were accumulated separately for study and analysis.

In a related research study (3) as discussed in Chapter III, decision-making was tested using only two conditions of internal control—strong and fair. A greater variability was found in that study in sample-sizes when decisions were made where fair internal controls existed than where strong internal control existed. This variability could have been due to the perceived increased risk by the test subject of possible errors in the accounting information when internal control is not strong. For this reason, sample-size decisions were also accumulated for each condition of internal control as given in the audit case. Such a breakdown would allow analysis of the effects of conservatism under each of the three internal control conditions.

The overall accumulation was made to test the null hypothesis and to analyze the broad effect of conservatism under all the conditions of the experiment.
The total sample-size decisions made by the subjects on the audit judgment case ranged from a low of 250 to a high of 172,800 (552,000 maximum sample size). Out of 116 subjects, no two had the same total.

A statistical analysis of the total sample size scores is

<table>
<thead>
<tr>
<th>Mean</th>
<th>S.D.</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>11,342.395</td>
<td>21,620.180</td>
<td>2007.383</td>
</tr>
</tbody>
</table>

The frequency distribution using intervals of 2,000 is shown in Table V on the following page. This frequency distribution cannot be considered normal and would, therefore, not meet the requirements for statistical methods which assume normality. "In the multiple regression analysis, it is assumed that the dependent variable is a quantitative measure with normal distribution..." (6, p. 425). For this reason, then, multiple regression and correlation could not be used on the total sample-size scores as originally intended.

An investigation of total scores separated into compliance and substantive sample sizes revealed the following:

<table>
<thead>
<tr>
<th>Range</th>
<th>Mean</th>
<th>S.D.</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Substantive</td>
<td>0-9,230</td>
<td>734.198</td>
<td>1449.609</td>
</tr>
</tbody>
</table>

The frequency distribution for these accumulations is similar to that for the total scores and, thus, could not be considered normal.
# TABLE V

**FREQUENCY DISTRIBUTION**
**OVERALL SAMPLE SIZES**

<table>
<thead>
<tr>
<th>Score</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>172,000 - 173,999</td>
<td>1</td>
</tr>
<tr>
<td>136,000 - 137,999</td>
<td>1</td>
</tr>
<tr>
<td>66,000 - 67,999</td>
<td>1</td>
</tr>
<tr>
<td>48,000 - 49,999</td>
<td>1</td>
</tr>
<tr>
<td>34,000 - 35,999</td>
<td>1</td>
</tr>
<tr>
<td>32,000 - 33,999</td>
<td>1</td>
</tr>
<tr>
<td>30,000 - 31,999</td>
<td>0</td>
</tr>
<tr>
<td>28,000 - 29,999</td>
<td>1</td>
</tr>
<tr>
<td>26,000 - 27,999</td>
<td>1</td>
</tr>
<tr>
<td>24,000 - 25,999</td>
<td>2</td>
</tr>
<tr>
<td>22,000 - 23,999</td>
<td>1</td>
</tr>
<tr>
<td>20,000 - 21,999</td>
<td>0</td>
</tr>
<tr>
<td>18,000 - 19,999</td>
<td>1</td>
</tr>
<tr>
<td>16,000 - 17,999</td>
<td>8</td>
</tr>
<tr>
<td>14,000 - 15,999</td>
<td>6</td>
</tr>
<tr>
<td>12,000 - 13,999</td>
<td>6</td>
</tr>
<tr>
<td>10,000 - 11,999</td>
<td>5</td>
</tr>
<tr>
<td>8,000 - 9,999</td>
<td>7</td>
</tr>
<tr>
<td>6,000 - 7,999</td>
<td>11</td>
</tr>
<tr>
<td>4,000 - 5,999</td>
<td>13</td>
</tr>
<tr>
<td>2,000 - 3,999</td>
<td>26</td>
</tr>
<tr>
<td>0 - 1,999</td>
<td>22</td>
</tr>
</tbody>
</table>
The greater range and variability of the compliance test scores could be due to the lack of strong firm policy in this area. This is assumed to occur because compliance testing is not as directly related to dollar errors as is substantive testing and, therefore, firms may not have been as rigorous in setting firm policy for these sample-size decisions.

In each case, the statistical findings for sample sizes accumulated for strong, fair, or weak internal controls reflect the same general statistical situation as were depicted for the overall test (see Table VI below).

**TABLE VI**

**SUMMARY OF STATISTICAL ANALYSIS OF SAMPLE SIZES INTERNAL CONTROL ACCUMULATIONS**

<table>
<thead>
<tr>
<th>Internal Control</th>
<th>Range</th>
<th>Mean</th>
<th>S.D.</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Strong</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall</td>
<td>40-120,100</td>
<td>6716.965</td>
<td>14188.297</td>
<td>1317.350</td>
</tr>
<tr>
<td>Compliance</td>
<td>20-120,050</td>
<td>6604.910</td>
<td>112.052</td>
<td>1315.669</td>
</tr>
<tr>
<td>Substantive</td>
<td>0-2000</td>
<td>112.052</td>
<td>204.482</td>
<td>18.986</td>
</tr>
<tr>
<td><strong>Fair</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall</td>
<td>90-52,715</td>
<td>3517.000</td>
<td>7442.383</td>
<td>691.008</td>
</tr>
<tr>
<td>Compliance</td>
<td>0-52,429</td>
<td>3323.327</td>
<td>7380.574</td>
<td>685.269</td>
</tr>
<tr>
<td>Substantive</td>
<td>0-3600</td>
<td>193.672</td>
<td>365.318</td>
<td>33.919</td>
</tr>
<tr>
<td><strong>Weak</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall</td>
<td>0-9107</td>
<td>1108.431</td>
<td>1749.650</td>
<td>162.451</td>
</tr>
<tr>
<td>Compliance</td>
<td>0-7800</td>
<td>679.957</td>
<td>1135.664</td>
<td>105.444</td>
</tr>
<tr>
<td>Substantive</td>
<td>0-9000</td>
<td>428.474</td>
<td>1105.056</td>
<td>102.602</td>
</tr>
</tbody>
</table>
An examination of the trend from strong internal control to weak internal control shows compliance testing decreasing as the internal control system becomes less adequate and substantive testing increases. This is the expected trend as provided by the guidelines in the official auditing literature (1, Au 320).

The observed high variance in compliance testing remains throughout the sample sizes even in the decisions made for a weak internal control system which would be expected to be at or near zero. As previously stated, this high variance is likely due to the lack of strong firm policy in this area which requires the auditor to use his own judgment.

The frequency distribution for each of these accumulations did not reflect normality and, therefore, multiple regression and correlation could not be used as a statistical method of analysis in this experiment.

Analysis of the Data

The statistical tool chosen to analyze the data was the Spearman Rank Order Correlation, sometimes called rho, which is a correlation between two variables. The only requirement that must be met for this tool is that both variables be measured in at least ordinal scales so that they can be ranked in two ordered series (7, p. 202).
Subprogram Nonpar Corr in the SPSS package was used to generate the statistics used to analyze the data. This program computes both Spearman's rho and Kendall's tau and both were used in analyzing the data. For the purposes of this research, $p<0.05$ is considered significant.

When the Nonpar Corr program was run to correlate the Wilson and Patterson Conservatism Scale with the sample-size scores, the results were as shown in Table VII below.

**TABLE VII**

**SUMMARY OF CORRELATIONS OF SAMPLE-SIZE DECISIONS WITH CONSERVATISM SCALE**

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Rho</th>
<th>Sig</th>
<th>Tau</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case as a whole:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall</td>
<td>-0.1172</td>
<td>.105</td>
<td>-0.826</td>
<td>.104</td>
</tr>
<tr>
<td>Compliance</td>
<td>-0.0947</td>
<td>.156</td>
<td>-0.0690</td>
<td>.147</td>
</tr>
<tr>
<td>Substantive</td>
<td>0.0001</td>
<td>.500</td>
<td>0.0090</td>
<td>.494</td>
</tr>
<tr>
<td>Internal-Control Based:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strong</td>
<td>-0.1162</td>
<td>.107</td>
<td>-0.0833</td>
<td>.108</td>
</tr>
<tr>
<td>Compliance</td>
<td>-0.1089</td>
<td>.122</td>
<td>-0.0774</td>
<td>.125</td>
</tr>
<tr>
<td>Substantive</td>
<td>-0.0434</td>
<td>.322</td>
<td>-0.0292</td>
<td>.336</td>
</tr>
<tr>
<td>Fair</td>
<td>-0.0561</td>
<td>.275</td>
<td>-0.0378</td>
<td>.293</td>
</tr>
<tr>
<td>Compliance</td>
<td>-0.0605</td>
<td>.259</td>
<td>-0.0432</td>
<td>.268</td>
</tr>
<tr>
<td>Substantive</td>
<td>0.0379</td>
<td>.343</td>
<td>0.0289</td>
<td>.335</td>
</tr>
<tr>
<td>Weak</td>
<td>0.0286</td>
<td>.380</td>
<td>0.0179</td>
<td>.392</td>
</tr>
<tr>
<td>Compliance</td>
<td>0.0681</td>
<td>.234</td>
<td>0.0500</td>
<td>.227</td>
</tr>
<tr>
<td>Substantive</td>
<td>0.0080</td>
<td>.465</td>
<td>0.0070</td>
<td>.459</td>
</tr>
</tbody>
</table>
As can be observed, the significance level is not acceptable for rejecting the null hypothesis that there is no significant relationship between evidential sample-size decisions made by auditors and the degree to which they are conservative or not conservative as measured by the Conservatism Scale. However, it is interesting to note that the sample sizes chosen for the strong system of controls (as reflected in the overall test) have produced the highest correlation coefficients. This is an indication of a stronger relationship between the conservatism scale and sample-size decision for the strong system of controls than is indicated for the sample-size decisions in the other internal control systems. As previously proposed, this variance could be due to lack of firm policy in the area of compliance testing.

The correlation of the Kogan and Wallach Choice Dilemmas Procedure and the sample-size scores are summarized in Table VIII. These correlation coefficients indicate a stronger relationship between sample-size decision and risk-taking propensity than could be inferred by the correlation coefficients relating sample-size decisions to the Conservatism Scale. As Table VIII illustrates, five of the correlations are significant at a probability <0.10.

The same pattern that occurred in the correlations between sample-size decisions and the conservatism scores
### TABLE VIII

**SUMMARY OF CORRELATIONS OF PROCEDURE SAMPLE-SIZE DECISIONS WITH CHOICE DILEMMAS**

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Rho</th>
<th>Sig</th>
<th>Tau</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case as a whole:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall</td>
<td>-0.1248</td>
<td>0.091*</td>
<td>-0.0873</td>
<td>0.092</td>
</tr>
<tr>
<td>Compliance</td>
<td>-0.1311</td>
<td>0.080*</td>
<td>-0.0908</td>
<td>0.084</td>
</tr>
<tr>
<td>Substantive</td>
<td>-0.0223</td>
<td>0.406</td>
<td>-0.0154</td>
<td>0.407</td>
</tr>
<tr>
<td>Internal-Control Based:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strong</td>
<td>-0.1512</td>
<td>0.053*</td>
<td>-0.1079</td>
<td>0.055</td>
</tr>
<tr>
<td>Compliance</td>
<td>-0.1472</td>
<td>0.057*</td>
<td>-0.1060</td>
<td>0.058</td>
</tr>
<tr>
<td>Substantive</td>
<td>-0.0611</td>
<td>0.257</td>
<td>-0.0496</td>
<td>0.241</td>
</tr>
<tr>
<td>Fair</td>
<td>-0.1070</td>
<td>0.126</td>
<td>-0.0802</td>
<td>0.124</td>
</tr>
<tr>
<td>Compliance</td>
<td>-0.1345</td>
<td>0.075*</td>
<td>-0.0993</td>
<td>0.078</td>
</tr>
<tr>
<td>Substantive</td>
<td>-0.0204</td>
<td>0.414</td>
<td>-0.0164</td>
<td>0.405</td>
</tr>
<tr>
<td>Weak</td>
<td>-0.0079</td>
<td>0.466</td>
<td>-0.0091</td>
<td>0.455</td>
</tr>
<tr>
<td>Compliance</td>
<td>-0.0552</td>
<td>0.278</td>
<td>-0.0407</td>
<td>0.271</td>
</tr>
<tr>
<td>Substantive</td>
<td>0.0382</td>
<td>0.342</td>
<td>0.0271</td>
<td>0.343</td>
</tr>
</tbody>
</table>

*p<0.10

are repeated in these correlations. The stronger relationship appears to be between the compliance testing decisions and Choice Dilemmas' scores. In every case, compliance sample-size decisions project the large correlation coefficients, thus indicating that aversion to risk exerts more influence on compliance decision-making than in the other decision-making situations. Again, the proposition is advanced that the lack of strong firm policy in the area of compliance testing has compelled the auditor to rely on his
personal judgment. When this occurs, the correlation between his personal judgment of sample sizes and his personal conservatism score produces the largest correlation coefficient indicating the strongest relationship.

In spite of these trends and patterns, however, the correlation coefficients between sample-size decisions and risk-taking propensity (as measured by the Kogan and Wallach Choice Dilemmas) are not significant. Accordingly, the null hypothesis must be accepted, i.e., there is no significant relationship between the evidential sample-size decisions made by auditors and the degree to which they are conservative or not conservative. Therefore, although inference can be made about the degree of association between the sample-size decisions and conservatism scores for this sample of auditors, it cannot be stated that this degree of association exists in the population of all auditors (7, p. 195).

In an effort to answer the questions raised in this research concerning the influence of firm bias on the decision-making of auditors, an analysis of variance was computed using sample-size decisions separated by firm to see if the firms were indeed homogeneous. Since they are all in the same profession, operating under the same standards and principles, it could be expected that there would be no significant difference between them.
The Kruskal-Wallis one-way ANOVA (7, pp. 184-194) was used to test whether there were significant differences between the auditor subjects when grouped by firms.

Sample values almost invariably differ somewhat, and the question is whether the differences among samples signify genuine population differences or whether they represent merely chance variations such as are to be expected among several random samples from the same population. The Kruskal-Wallis technique tests the null hypothesis that the ...samples come from the same population or from identical populations with respect to averages (7, p. 184).

In addition, Siegel states "...the Kruskal-Wallis test will be found to be more efficient [with regard to other such tests] because it uses more information" (7, p. 193).

This test assumes that the variable in question has an underlying continuous distribution and at least ordinal measurement. The sample-size decisions which are the variable in question meet these requirements.

The results of the one-way analysis of variance with respect to the nine firms participating in this research are illustrated in Table IX on the following page.

In every circumstance except weak-substantive the Chi-square statistic is significant at the p<0.005 level, in three cases at the p<0.001, and in one instance at p<.000.

Thus, under all conditions of decision-making except when making substantive test decisions with a weak system of internal controls, the nine firms are significantly different.
<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>Chi Square</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>69.91</td>
<td>50.25</td>
<td>85.36</td>
<td>42.85</td>
<td>45.56</td>
<td>73.86</td>
<td>44.68</td>
<td>37.00</td>
<td>62.30</td>
<td>26.317</td>
<td>0.001</td>
</tr>
<tr>
<td>Compliance</td>
<td>71.00</td>
<td>50.50</td>
<td>85.34</td>
<td>42.92</td>
<td>46.56</td>
<td>73.43</td>
<td>44.25</td>
<td>36.94</td>
<td>61.40</td>
<td>26.467</td>
<td>0.001</td>
</tr>
<tr>
<td>Substantive</td>
<td>42.82</td>
<td>59.63</td>
<td>80.39</td>
<td>57.81</td>
<td>50.83</td>
<td>75.29</td>
<td>41.91</td>
<td>39.81</td>
<td>68.20</td>
<td>22.695</td>
<td>0.004</td>
</tr>
<tr>
<td>Strong</td>
<td>70.36</td>
<td>55.63</td>
<td>63.43</td>
<td>45.31</td>
<td>44.44</td>
<td>73.33</td>
<td>42.91</td>
<td>43.38</td>
<td>57.90</td>
<td>23.123</td>
<td>0.003</td>
</tr>
<tr>
<td>Compliance</td>
<td>70.73</td>
<td>55.06</td>
<td>84.04</td>
<td>45.15</td>
<td>44.89</td>
<td>72.71</td>
<td>43.36</td>
<td>43.44</td>
<td>57.15</td>
<td>22.960</td>
<td>0.003</td>
</tr>
<tr>
<td>Substantive</td>
<td>49.23</td>
<td>67.94</td>
<td>80.43</td>
<td>61.62</td>
<td>47.94</td>
<td>73.76</td>
<td>28.68</td>
<td>47.19</td>
<td>78.50</td>
<td>34.479</td>
<td>0.000</td>
</tr>
<tr>
<td>Fair</td>
<td>68.95</td>
<td>55.50</td>
<td>85.50</td>
<td>44.46</td>
<td>46.78</td>
<td>72.31</td>
<td>44.77</td>
<td>32.75</td>
<td>66.20</td>
<td>26.319</td>
<td>0.001</td>
</tr>
<tr>
<td>Compliance</td>
<td>69.05</td>
<td>49.50</td>
<td>85.00</td>
<td>44.23</td>
<td>47.00</td>
<td>71.83</td>
<td>45.57</td>
<td>34.19</td>
<td>65.80</td>
<td>24.946</td>
<td>0.002</td>
</tr>
<tr>
<td>Substantive</td>
<td>48.68</td>
<td>71.50</td>
<td>82.32</td>
<td>52.19</td>
<td>51.61</td>
<td>70.52</td>
<td>40.66</td>
<td>33.88</td>
<td>73.65</td>
<td>25.187</td>
<td>0.001</td>
</tr>
<tr>
<td>Weak</td>
<td>61.00</td>
<td>36.56</td>
<td>68.36</td>
<td>54.92</td>
<td>72.06</td>
<td>77.86</td>
<td>40.48</td>
<td>41.06</td>
<td>64.90</td>
<td>22.065</td>
<td>0.005</td>
</tr>
<tr>
<td>Compliance</td>
<td>68.14</td>
<td>38.63</td>
<td>64.46</td>
<td>56.73</td>
<td>71.78</td>
<td>79.57</td>
<td>38.14</td>
<td>42.19</td>
<td>58.60</td>
<td>23.495</td>
<td>0.003</td>
</tr>
<tr>
<td>Substantive</td>
<td>42.32</td>
<td>48.31</td>
<td>60.68</td>
<td>61.31</td>
<td>58.33</td>
<td>76.43</td>
<td>51.43</td>
<td>44.94</td>
<td>66.85</td>
<td>12.313</td>
<td>0.138</td>
</tr>
</tbody>
</table>
In this chapter the data collected through administration of the research instruments were examined and analyzed. From an analysis of the scores of the two psychological tests, the auditors as a group were found to be heterogeneous and slightly conservative with regard to resistance to change, but homogeneous and distinctly conservative in relation to risk aversion. An investigation of the rank order correlation coefficients indicated a stronger relationship between both conservatism scores and decision-making in compliance testing than in substantive testing. However, these assumptions can only be made about this specific sample because the correlation coefficients were not significant and thus the null hypothesis was accepted.

The most interesting development was the pattern of larger correlation coefficients between compliance testing decision and both conservatism scores. A possible explanation for this relationship derives from the assumed lack of strong firm policy in compliance testing because it is not directly related to dollar error. Therefore, the firm effect would not be as predominant in this type of decision. A one-way analysis of the subjects by firm produced eleven Chi-square values that were significant at levels from $p<0.000$ to $p<0.005$.

The next chapter presents the conclusions and pertinent findings based on this research as well as suggesting further research.
CHAPTER BIBLIOGRAPHY


CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

Summary of the Research

This research was undertaken to test the effects of conservatism on the decisions made by auditors. Two of the instruments chosen for this task were psychological tests, the Wilson and Patterson Conservatism Scale and Kogan and Wallach’s Choice Dilemmas Procedure. The psychological tests were used to measure conservatism on two bases: resistance to change and aversion to risk. The other instrument, an audit judgment case, was the source of the evidential sample-size decisions. An effort was made to design a case that would have as much external validity as possible and still be capable of overriding firm effects in decision-making.

These research tools were administered to 116 practicing auditors employed by nine large public accounting firms in Dallas. The subjects were selected on an essentially random basis, although the public accounting firms chose the date and time for administration of the research instruments. In each firm the investigator met with the subjects, provided instructions, and monitored completion of the instruments.
When the data were collected and statistical analysis begun, the investigator discovered that the statistical method planned for analyzing the data—multiple correlation and regression—could not be used due to the distribution of the dependent variable. A reasonably normal distribution is an essential requirement for multiple correlation and distribution, and the dependent variable could not meet this requirement. Instead, a non-parametric technique using statistics based on rank, Spearman's rho and Kendall's tau, was substituted.

The evaluation of the research results provided by the two psychological tests indicated that, when measured on the construct of resistance to change, auditors as a group are essentially heterogeneous and slightly conservative. However, the auditors' test scores on the construct of aversion to risk reflected a homogeneous group who were distinctly conservative.

The audit judgment case provided evidential decisions regarding sample sizes made for three assumed clients whose internal control systems were described in the case as strong, fair, or weak. An analysis of the decisions made under these conditions using rank order correlation indicated a stronger relationship existed between sample sizes and both measures of conservatism for compliance testing than for any other sample-size decisions. This relationship was
a recognized possibility by the investigator in that firm effects could suppress the personal judgment of auditors although the judgment case was carefully designed to avoid it. Because firm policy in compliance samples could be considered weak due to their rather indirect influence on dollar error, it was not surprising that correlations for compliance samples would be larger. This weak firm policy could explain the results of the analysis as related to this specific sample of auditors. However, these correlations were not significant at the $p<0.05$ level. Therefore, the null hypothesis could not statistically be rejected. Due to the low significance level, the results of this research cannot validly be applied to auditors as a whole.

Firm effects were evaluated to discover if there was any significant difference between auditors on a firm basis using Kruskal-Wallis one-way analysis of variance. Eleven out of twelve dependent variables had Chi-square values that were significant at levels from $p<0.000$ to $p<0.005$.

**Pertinent Findings**

The purpose of this research was to test the effect of conservatism on the decisions made by auditors. Although some interesting suppositions can be made about the relationships indicated by the correlation coefficients, no significant effects could be supported by the research findings.
Instead, the most interesting and pertinent finding was the influence of firm bias on the auditor's judgment. This research seems to indicate that the firm effect is more important in auditor's decision-making than personal characteristics. If this is indeed the case, it could be said that the different audit philosophies held by the public accounting firms and instilled in their auditors may be the prime cause of the substantial differences that have been continuously found in auditor judgments.

The discovery that the dependent variable could not meet the requirement of normality (assumed in using multiple correlation) raises an interesting question. How many researchers who use multiple regression do so without carefully checking the distribution of the dependent variable? It is possible that reported research results were not valid due to the misuse of the statistical tool.

The finding that auditors have a tendency to be averse to risk is not surprising, as accountants are stereotyped as very conservative. In this case, however, the stereotype seems to be true. The indication that auditors had only a slight leaning toward conservatism as measured by resistance to change is more interesting since this finding confounds the traditional view.
Limitations

In evaluating these research findings, it is important to constantly keep in mind that results are only as valid as the research which produced them and there are inherent weaknesses in most research efforts.

The use of psychological tests and opinion questionnaires can put serious limitations on an experimental study if they do not measure with sufficient reliability and validity the attitudes or opinions they propose to measure. Therefore, to the extent that the instruments used in this study do not meet acceptable criteria for reliability and/or validity, the results of this research must be qualified.

Another limitation that is inherent whenever questionnaires and psychological tests are used is "faking." In both kinds of tests, the results of the study could have been distorted by "faking" on the part of the respondents in the answering process. Analysis of the data often cannot reveal such activity unless that facility has been built into the test. However, the effect can be minimized by the size of the sample which in this research was considered large enough to absorb erroneous data without distorting the results.

This investigation is limited also by the fact that measuring the degree of conservatism in a subject does not negate the presence and influence of other biases which may have a stronger affect on his decision-making.
The use of rank order correlation may also place limits on the research since it is not as powerful a statistical tool as those correlations that require normal distribution. Any or all of these factors could limit the research and require qualification of the results.

Need for Further Research

These research results have provided additional insight into the decision-making of auditors and the influences that bear upon their judgment. More research is needed in this area to clarify some of the questions that have been raised. For this reason, it would seem fruitful to replicate this research using psychological instruments that were more reliable than those utilized in this effort. Even more important would be the choice of a decision vehicle that would circumvent as much as possible the pressure of firm effects. For example, an audit judgment case in which decisions were made concerning reporting on qualified opinions.

Considering the role that firm effects may play in inconsistency in decisions, research should be undertaken to evaluate the difference in firm philosophy in areas such as compliance and substantive testing. The results of such research could answer the questions raised by this study as regards the areas in which firm policy seems strong. Another and more vital question would be, are the differences between
firms testing policies sufficiently large to impact the fair presentation and comparability of the financial statements?

Although the findings of this research did not provide support for the proposition that conservatism has an effect upon decision-making, contribution was made to the further understanding of auditor's judgment and the possible influence of firm effect upon decision-making. With more behavioral research in decision-making, understanding and knowledge will surely be advanced.
OPINION QUESTIONNAIRE I

Which of the Following Do You Favor or Believe In?

Circle 'Yes' or 'No'. If absolutely uncertain, circle '?'. There are no right or wrong answers; do not discuss; just give your first reaction. Answer all items.

1. Death penalty
2. Evolution theory
3. Nun's habits
4. Striptease shows
5. Sabbath observance
6. Hippies
7. Patriotism
8. Modern art
9. Self-denial
10. Working mothers
11. Greek fraternities/sororities
12. Birth control
13. Military drill
14. Co-education
15. Divine law
16. Socialism
17. White superiority
18. Cousin marriage
19. Moral training
20. Suicide
21. Law by the book
22. Legalized abortion
23. Empire-building
24. Equal Rights Amendment
25. Licensing laws
26. Computer music
27. Chastity
28. Fluoridation
29. Keeping the Panama Canal
30. Women preachers
31. Conventional clothes
32. Welfare
33. Segregation
34. Nudist camps
35. Church authority
36. Disarmament
37. Censorship
<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>38. White lies</td>
<td>Yes</td>
<td>?</td>
</tr>
<tr>
<td>40. Mixed marriages</td>
<td>Yes</td>
<td>?</td>
</tr>
<tr>
<td>41. Strict rules</td>
<td>Yes</td>
<td>?</td>
</tr>
<tr>
<td>42. Student pranks</td>
<td>Yes</td>
<td>?</td>
</tr>
<tr>
<td>43. Strait jackets</td>
<td>Yes</td>
<td>?</td>
</tr>
<tr>
<td>44. Living together</td>
<td>Yes</td>
<td>?</td>
</tr>
<tr>
<td>45. Fidelity in marriage</td>
<td>Yes</td>
<td>?</td>
</tr>
<tr>
<td>46. Gay rights</td>
<td>Yes</td>
<td>?</td>
</tr>
<tr>
<td>47. Inborn conscience</td>
<td>Yes</td>
<td>?</td>
</tr>
<tr>
<td>48. Gun control</td>
<td>Yes</td>
<td>?</td>
</tr>
<tr>
<td>49. Bible truth</td>
<td>Yes</td>
<td>?</td>
</tr>
<tr>
<td>50. Recognizing Red China</td>
<td>Yes</td>
<td>?</td>
</tr>
</tbody>
</table>
OPINION QUESTIONNAIRE II

On the following pages, you will find a series of situations that are likely to occur in everyday life. The central person in each situation is faced with a choice between two alternative courses of action, which we might call X and Y. Alternative X is more desirable and attractive than alternative Y, but the probability of attaining or achieving X is less than that of attaining or achieving Y.

For each situation on the following pages, you will be asked to indicate the minimum odds of success you would demand before recommending that the more attractive or desirable alternative, X, be chosen.

Read each situation carefully before giving your judgment. Try to place yourself in the position of the central person in each of the situations. There are twelve situations in all. Please do not omit any of them.

1. Mr. A, a electrical engineer, who is married and has one child, has been working for a large electronics corporation since graduating from college five years ago. He is assured of a lifetime job with a modest, though adequate salary, and liberal pension benefits upon retirement. On the other hand, it is very unlikely that his salary will increase much before he retires. While attending a convention, Mr. A is offered a job with a small, newly founded company which has a highly uncertain future. The new job would pay more to start and would offer the possibility of a share in the ownership if the company survived the competition of the larger firms.

Imagine that you are advising Mr. A. Listed below are several probabilities or odds of the new company’s proving financially sound. Please check the lowest probability that you would consider acceptable to make it worthwhile for Mr. A to take the new job.

_____ The chances are 1 in 10 that the company will prove financially sound.
_____ The chances are 3 in 10 that the company will prove financially sound.
_____ The chances are 5 in 10 that the company will prove financially sound.
_____ The chances are 7 in 10 that the company will prove financially sound.

99
The chances are 9 in 10 that the company will prove financially sound.

Place a check here if you think Mr. A should not take the new job no matter what the probabilities.

2. Mr. B, a 45-year-old accountant, has recently been informed by his physician that he has developed a severe heart ailment. The disease would be sufficiently serious to force Mr. B to change many of his strongest life habits --reducing his work load, drastically changing his diet, giving up favorite leisure-time pursuits. The physician suggests that a delicate medical operation could be attempted which, if successful, would completely relieve the heart condition. But its success could not be assured, and in fact, the operation might prove fatal.

Imagine that you are advising Mr. B. Listed below are several probabilities or odds that the operation will prove successful. Please check the lowest probability that you would consider acceptable for the operation to be performed.

Place a check here if you think Mr. B should not have the operation no matter what the probabilities.

The chances are 9 in 10 that the operation will be a success.

The chances are 7 in 10 that the operation will be a success.

The chances are 5 in 10 that the operation will be a success.

The chances are 3 in 10 that the operation will be a success.

The chances are 1 in 10 that the operation will be a success.

3. Mr. C, a married man with two children, has a steady job that pays him about $15,000 per year. He can easily afford the necessities of life, but few of the luxuries. Mr. C's father, who died recently, carried a $10,000 life insurance policy. Mr. C would like to invest this money in stocks. He is well aware of the secure "blue-chip" stocks and bonds that would pay approximately 6% on his investment. On the other hand, Mr. C has heard that the stocks of a relatively unknown Company X might double their present value if a new product currently in production is favorably received by the buying public. However, if the product is unfavorably received, the stocks would decline.

Imagine you are advising Mr. C. Listed below are several probabilities or odds that Company X stock will double their value. Please check the lowest probability
that you would consider acceptable for Mr. C to invest in Company X stocks.

_____ The chances are 1 in 10 that the stocks will double in value.
_____ The chances are 3 in 10 that the stocks will double in value.
_____ The chances are 5 in 10 that the stocks will double in value.
_____ The chances are 7 in 10 that the stocks will double in value.
_____ The chances are 9 in 10 that the stocks will double in value.
_____ Place a check here if you think Mr. C should not invest in Company X stocks no matter what the probabilities.

4. Mr. D is the captain of College X's football team. College X is playing its traditional rival, College Y, in the final game of the season. The game is in its final seconds, and Mr. D's team, College X, is behind in the score. College X has time to run one more play. Mr. D, the captain, must decide whether it would be best to settle for a tie score with a play which would be almost certain to work or, on the other hand, should he try a more complicated and risky play which could bring victory if it succeeded, but defeat if not.

Imagine that you are advising Mr. D. Listed below are several probabilities or odds that the risky play will work. Please check the lowest probability that you would consider acceptable for the risky play to be attempted.

_____ Place a check here if you think Mr. D should not attempt the risky play no matter what the probabilities.
_____ The chances are 9 in 10 that the risky play will work.
_____ The chances are 7 in 10 that the risky play will work.
_____ The chances are 5 in 10 that the risky play will work.
_____ The chances are 3 in 10 that the risky play will work.
_____ The chances are 1 in 10 that the risky play will work.

5. Mr. E is president of a light metals corporation in the United States. The corporation is quite prosperous, and has strongly considered the possibilities of business expansion by building an additional plant in a new location. The choice is between building another plant in the U.S., where there would be a moderate return on the initial investment, or building a plant in a foreign country. Lower labor costs and easy access to raw materials in that country would mean a much higher return on the initial investment. On the other
hand, there is a history of political instability and revo-
lution in the foreign country under consideration. In fact,
the leader of a small minority party is committed to na-
tionalizing, that is, taking over all foreign investments.

Imagine that you are advising Mr. E. Listed below are several probabilities or odds of continued political sta-
bility in the foreign country under consideration. Please check the lowest probability that you would consider accept-
table for Mr. E’s corporation to build a plant in that country.

___ The chances are 1 in 10 that the foreign country will remain politically stable.
___ The chances are 3 in 10 that the foreign country will remain politically stable.
___ The chances are 5 in 10 that the foreign country will remain politically stable.
___ The chances are 7 in 10 that the foreign country will remain politically stable.
___ The chances are 9 in 10 that the foreign country will remain politically stable.
___ Place a check here if you think Mr. E’s corporation should not build a plant in the foreign country, no matter what the probabilities.

6. Mr. F is currently a college senior who is very eager to pursue graduate study in chemistry leading to the Doctor of Philosophy degree. He has been accepted by both University X and University Y. University X has a world-
wide reputation for excellence in chemistry. While a degree from University X would signify outstanding training in this field, the standards are so very rigorous that only a fraction of the degree candidates actually receive the degree. University Y, on the other hand, has much less of a reputa-
tion in chemistry, but almost everyone admitted is awarded the Doctor of Philosophy degree, though the degree has much less prestige than the corresponding degree from University X.

Imagine that you are advising Mr. F. Listed below are several probabilities or odds that Mr. F would be awarded a degree at University X, the one with the greater prestige. Please check the lowest probability that you would consider acceptable to make it worthwhile for Mr. F to enroll in University X rather than University Y.
Place a check here if you think Mr. F should not enroll in University X, no matter what the probabilities.

The chances are 9 in 10 that Mr. F would receive a degree from University X.

The chances are 7 in 10 that Mr. F would receive a degree from University X.

The chances are 5 in 10 that Mr. F would receive a degree from University X.

The chances are 3 in 10 that Mr. F would receive a degree from University X.

The chances are 1 in 10 that Mr. F would receive a degree from University X.

7. Mr. G, a competent chess player, is participating in a national chess tournament. In an early match he draws the top-favored player in the tournament as his opponent. Mr. G has been given a relatively low ranking in view of his performance in previous tournaments. During the course of his play with the top-favored man, Mr. G notes the possibility of a deceptive though risky maneuver which might bring him a quick victory. At the same time, if the attempted maneuver should fail, Mr. G would be left in an exposed position and defeat would almost certainly follow.

Imagine that you are advising Mr. G. Listed below are several probabilities or odds that Mr. G's deceptive play would succeed. Please check the lowest probability that you would consider acceptable for the risky play in question to be attempted.

The chances are 1 in 10 that the play would succeed.

The chances are 3 in 10 that the play would succeed.

The chances are 5 in 10 that the play would succeed.

The chances are 7 in 10 that the play would succeed.

The chances are 9 in 10 that the play would succeed.

Place a check here if you think Mr. G should not attempt the risky play, no matter what the probabilities.

8. Mr. H, a college senior, has studied the piano since childhood. He has won amateur prizes and given small recitals, suggesting that Mr. H has considerable musical talent. As graduation approaches, Mr. H has the choice of going to medical school to become a physician, a profession which would bring certain prestige and financial rewards; or entering a conservatory of music for advanced training with a well-known pianist. Mr. H realizes that even upon completion of his piano studies, which would take many more years and a lot of money, success as a concert pianist would not be assured.
Imagine that you are advising Mr. H. Listed below are several probabilities or odds that Mr. H would succeed as a concert pianist. Please check the lowest probability that you would consider acceptable for Mr. H to continue with his musical training.

_____ Place a check here if you think Mr. H should not pursue his musical training, no matter what the probabilities.
_____ The chances are 9 in 10 that Mr. H would succeed as a concert pianist.
_____ The chances are 7 in 10 that Mr. H would succeed as a concert pianist.
_____ The chances are 5 in 10 that Mr. H would succeed as a concert pianist.
_____ The chances are 3 in 10 that Mr. H would succeed as a concert pianist.
_____ The chances are 1 in 10 that Mr. H would succeed as a concert pianist.

9. Mr. J is an American captured by the enemy in World War II and placed in a prisoner-of-war camp. Conditions in the camp are quite bad, with long hours of hard physical labor and a barely sufficient diet. After spending several months in this camp, Mr. J notes the possibility of escape by concealing himself in a supply truck that shuttles in and out of the camp. Of course, there is no guarantee that the escape would prove successful. Recapture by the enemy could well mean execution.

Imagine you are advising Mr. J. Listed below are several probabilities or odds of a successful escape from the prisoner-of-war camp. Please check the lowest probability that you would consider acceptable for an escape to be attempted.

_____ The chances are 1 in 10 that the escape would succeed.
_____ The chances are 3 in 10 that the escape would succeed.
_____ The chances are 5 in 10 that the escape would succeed.
_____ The chances are 7 in 10 that the escape would succeed.
_____ The chances are 9 in 10 that the escape would succeed.
_____ Place a check here if you think Mr. J should not try to escape no matter what the probabilities.

10. Mr. K is a successful businessman who has participated in a number of civic activities of considerable value to the community. Mr. K has been approached by the leaders of his political party as a possible congressional candidate in the next election. Mr. K's party is a minority party in the district, though the party has won occasional elections
in the past. Mr. K would like to hold political office, but to do so would involve a serious financial sacrifice, since the party has insufficient campaign funds. He would also have to endure the attacks of his political opponents in a hot campaign.

Imagine that you are advising Mr. K. Listed below are several probabilities or odds of Mr. K's winning the election in his district. Please check the lowest probability that you would consider acceptable to make it worthwhile for Mr. K to run for political office.

Place a check here if you think Mr. K should not run for political office no matter what the probabilities.

The chances are 9 in 10 that Mr. K will win the election.
The chances are 7 in 10 that Mr. K will win the election.
The chances are 5 in 10 that Mr. K will win the election.
The chances are 3 in 10 that Mr. K will win the election.
The chances are 1 in 10 that Mr. K will win the election.

11. Mr. L, a married 30-year-old research physicist, has been given a five-year appointment by a major university laboratory. As he contemplates the next five years, he realizes that he might work on a difficult, long-term problem which, if a solution could be found, would resolve basic scientific issues in the field and bring high scientific honors. If no solution were found, however, Mr. L would have little to show for his five years in the laboratory, and this would make it hard for him to get a good job afterwards. On the other hand, as most of his professional associates are doing, he could work on a series of short-term problems where solutions would be easier to find, but where the problems are of lesser scientific importance.

Imagine that you are advising Mr. L. Listed below are several probabilities or odds that a solution would be found to the difficult, long-term problem that Mr. L has in mind. Please check the lowest probability that you would consider acceptable to make it worthwhile for Mr. L to work on the more difficult, long-term problem.

The chances are 1 in 10 that Mr. L would solve the long-term problem.
The chances are 3 in 10 that Mr. L would solve the long-term problem.
The chances are 5 in 10 that Mr. L would solve the long-term problem.
The chances are 7 in 10 that Mr. L would solve the long-term problem.
The chances are 9 in 10 that Mr. L would solve the long-term problem.

Place a check here if you think Mr. L should not choose the long-term, difficult problem, no matter what the probabilities.

12. Mr. M is contemplating marriage to Miss T, a girl whom he has known for a little more than a year. Recently, however, a number of arguments have occurred between them, suggesting some sharp differences of opinion in the way each views certain matters. Indeed, they decided to seek professional advice from a marriage counselor as to whether it would be wise for them to marry. On the basis of these meetings with a marriage counselor, they realize that a happy marriage, while possible, would not be assured.

Imagine you are advising Mr. M and Miss T. Listed below are several probabilities or odds that their marriage would prove to be a happy and successful one. Please check the lowest probability that you would consider acceptable for Mr. M and Miss T to get married.

Place a check here if you think Mr. M and Miss T should not marry, no matter what the probabilities.

The chances are 9 in 10 that the marriage would be happy and successful.

The chances are 7 in 10 that the marriage would be happy and successful.

The chances are 5 in 10 that the marriage would be happy and successful.

The chances are 3 in 10 that the marriage would be happy and successful.

The chances are 1 in 10 that the marriage would be happy and successful.
AUDIT JUDGMENT CASE

Through the years, Graham and Grant, a national public accounting firm, has become especially knowledgeable in the area of retail/wholesale businesses. For this reason, although they have clients in various industries, their new clients each year generally include a large number of retail/wholesale firms. This year is no exception with three new clients, who are wholesale distributors, being acquired in the Dallas-Ft. Worth area alone due to the sudden death of the CPA who had been their auditor for a number of years.

The three firms are Top Value Auto Parts, Texas Radio and Electronics, Inc. and Acme Household Appliances. These companies seem to be similar for a number of reasons: they are all medium-size distributors that have been in business for 20-25 years; the men who started the businesses are still managing them and there has been little turnover among the employees who have been added to the payroll as the companies have expanded; all three firms use lines of credit with their respective banks whose credit policies require that audited financial statements be furnished each year; the financing in each firm is handled by the man who organized the business and there has been no difficulty in getting the necessary financing at reasonable rates through the years; the debt to equity ratio in each firm is compatible with other firms in their industry and none is considered to be highly leveraged; although all of the firms have grown over the years, the growth has been gradual and few problems have developed as a result. The one area in which they do differ is internal controls and their specific differences in this area will be subsequently documented.

The firm policy of Graham and Grant with regard to internal control requires that the manager of each audit determine the relative strength or weakness of internal controls in relevant accounting areas from an internal control questionnaire. The manager gives this information, along with general guidelines and a flowchart, to the senior auditors assigned to audit the different areas. These auditors are then required to use the manager's assessment of internal controls in their area as the basis for a preliminary plan in which they decide the initial extent of compliance and/or substantive testing.
The general guidelines for the reliance of G & G auditors on the assessments of internal control are:

- **Strong** - place significant reliance on controls.
- **Fair** - place some reliance on controls.
- **Weak** - place little reliance on controls.

In addition, the G & G firm manual states with regard to compliance and/or substantive testing:

As more reliance is placed upon internal controls in relevant audit areas, more compliance tests are needed to verify the assessed strength of internal controls and less substantive tests are required. However, as less reliance can be placed upon internal controls, less compliance tests are needed and more substantive tests are required.

In the audits for the three new wholesale companies, the manager has decided not to provide the auditors with last year's sample sizes because the previous auditor did not use evaluations of internal controls to plan the extent of testing.

As an auditor for G & G, you are in charge of auditing the revenue cycle of Top Value, Texas Radio and Acme Home. As a part of your audit program for the revenue cycle, you must choose some preliminary sample sizes for compliance and/or substantive testing using judgmental sampling and based upon the internal control information for each company which is given to you by the audit manager.

**Top Value Auto Parts Internal Control Information**

John Rigby, President and founder of Top Value, is completely convinced of the value of a strong internal control system and has taken an active part in developing and supervising Top Value's policies and procedures as the business has expanded. A flowchart of the revenue cycle and explanation of the present system are on the following page.

Audit Manager's evaluation: **Strong**

No weaknesses were noted and there was good separation of duties. In addition, the Assistant Controller makes unscheduled checks of the system to see that it is functioning properly.
This flowchart shows the normal flow of activities. As each function is completed, the related document is initialed by the person who performed the task. The flowchart does not, however, indicate the proper procedures for exceptions. These procedures are:

1. If a sales order is not approved for credit, it is returned to the order clerk who tries to arrange a C.O.D. shipment with the customer. If a C.O.D. shipment is acceptable, the order proceeds normally; otherwise, it is voided and filed.

2. If some of the ordered merchandise is not available, a backorder is written and filed by a warehouse clerk and the amounts shipped and backordered are indicated on the packing list.

3. If the goods selected and sent to shipping do not match the types and quantities on the packing list, they are returned to the warehouse for correction.

4. If errors are found by the billing clerk in her check of sales invoices, the invoices are returned to the typists for correction.

The Accounting Department records sales invoice information in the sales journal, subsidiary ledgers, and perpetual inventory records.
Top Value distributes auto parts to a network of discount auto parts stores in northeast Texas. Their profit is based on a high volume of relatively low-priced auto parts and supplies. An estimate of total sales invoices for this year would be about 40,000 invoices that range in amount from $10 to $2,000.

BASED UPON THE AUDIT MANAGER’S INTERNAL CONTROL EVALUATION AND THE ABOVE INFORMATION, CHOOSE PRELIMINARY SAMPLE SIZES FOR THE FOLLOWING TESTS:

**Compliance Tests**

1. Review the file of numerical sales orders for ____ days:
   a. to test for numerical sequence.
   b. to determine that both copies of voided sales orders have been filed.

   **Audit Objective:** to ascertain that a copy of all sales orders are in the file, that none have been lost, misplaced or duplicated and that no copies of voided sales orders could have gotten into the system.

2. Review the file of numerical sales invoices for ____ days:
   a. to test numerical sequence.
   b. to determine that all copies of voided sales invoices have been filed.

   **Audit Objective:** to ascertain that all recorded sales are in the file, that no invoices have been lost, misplaced or duplicated, and that no copies of voided sales invoices could have gotten into the system.

3. Randomly select a sample of ____ sales invoices:
   a. to examine for support packing list and sales order.
   b. to determine that the clerk, who is responsible, has initialed to indicate performance of the required step of checking extensions and credit approval.

   **Audit Objective:** to ascertain that recorded sales are for shipments actually made to nonfictitious customers, are for the amount of goods shipped and are correctly billed.

4. Review the file of numerical packing lists for ____ days to test numerical sequence.

   **Audit Objective:** to ascertain that all recorded shipments are in the file and that no packing list has been lost, misplaced or duplicated.
5. Randomly select a sample of ____ packing lists to test for proper initials as indication that shipping approval was checked.

**Audit Objective:** to ascertain that all shipments made were properly approved.

**Substantive Tests**

6. Randomly select a sample of ____ sales invoices:
   a. to check extension and footing totals.
   b. to compare billing price to authorized price lists.
   c. to trace the totals to the sales journal and accounts receivable ledger.

**Audit Objective:** to ascertain that existing sales are correctly billed and recorded.

7. Select a random sample of ____ packing lists:
   a. to be traced to the corresponding sales order and sales invoice.
   b. to be traced to perpetual inventory records.
   c. to determine that types and quantities shipped are types and quantities ordered and billed.

**Audit Objective:** to ascertain that the amount of goods ordered and billed were the amounts shipped and recorded in inventory records.

**Texas Radio and Electronics, Inc. Internal Control Information**

Texas Radio was organized in 1954 by Daniel Moss who is a firm believer in "a day's work for a day's pay". Because of this philosophy, Mr. Moss has resisted his CPA's advice concerning the separation of certain duties when he has felt that such a separation would not fully occupy the time of the employees involved. A flowchart of the revenue cycle and explanation of the present system of internal control for Texas Radio are presented on the following page.

**Audit Manager's evaluation:** Fair

Weaknesses and strengths:

1. Typists prepare sales orders and sales invoices.

   Possible errors or irregularities - fictitious sales orders could be created and goods would be shipped.
Offsetting strength \( (S_1) \) - credit approval required before goods are shipped.

\[ W_2 \]
Shipping clerks fill orders, prepare packing lists and also ship goods.

Possible errors or irregularities - shipping clerks could ship more goods than on sales order, ship without approval or ship to a fictitious customer.

Offsetting strength \( (S_2) \) - approved sales order filed with packing list provides support for shipments.

\[ W_3 \]
Approved sales order filed in shipping department.

Possible errors or irregularities - clerk typists and billing clerk have no evidence that shipment was approved.

No offsetting strength.

\[ S_3 \]
Extensions are checked by an independent person.

\[ S_4 \]
The accounting function is separate from billing.
The procedures for exceptions to the system are essentially the same as those for Top Value, when they apply, and the Accounting Department performs the same functions.

Texas Radio distributes radios, TVs and other electronic products to retail stores in northeast Texas. An estimate of total sales invoices for this year would be about 26,000 invoices that range in amount from $15 to $7,000.

BASED UPON THE AUDIT MANAGER'S INTERNAL CONTROL EVALUATION AND THE ABOVE INFORMATION, CHOOSE PRELIMINARY SAMPLE SIZES FOR THE FOLLOWING TESTS:

Compliance Tests

1. Review the file of numerical sales invoices for ____ days:
   a. to test numerical sequence.
   b. to determine that all copies of voided sales invoices have been filed.

   **Audit Objective:** to ascertain that all recorded sales are in the file, that no invoices have been lost, misplaced or duplicated and that no copies of voided sales invoices could have gotten into the system.

2. Randomly select a sample of ____ sales invoices from the numerical file to determine that the clerk, who is responsible, has initialed to indicate performance of the required step of checking extensions.

   **Audit Objective:** to ascertain that sales are correctly billed.

3. Select a random sample of ____ sales invoices from the alphabetical file to examine for supporting packing list.

   **Audit Objective:** to ascertain that recorded sales are for shipments actually made to nonfictitious customers for types and quantities shipped.

4. Review the file of numerical packing lists for ____ days to test numerical sequence.

   **Audit Objective:** to ascertain that all recorded shipments are in the file and that no packing list has been lost, misplaced or duplicated.
5. Randomly select a sample of ____ packing lists to examine for supporting approved sales order.

   Audit Objective: to ascertain that shipments made were properly approved.

Substantive Tests

6. Randomly select a sample of ____ sales invoices:
   a. to check extension and footing totals.
   b. to compare billing price to authorized price lists.
   c. to trace the totals to the sales journal and accounts receivable ledger.

   Audit Objective: to ascertain that existing sales are correctly billed and recorded.

7. Select a random sample of ____ packing lists:
   a. to be traced to corresponding sales order and sales invoice.
   b. to be traced to perpetual inventory records.
   c. to determine that types and quantities shipped are types and quantities ordered and billed.

   Audit Objective: to ascertain that the amount of goods ordered and billed were the amounts shipped and recorded in inventory records.

Acme Household Appliances Internal Control Information

When John Salter started his business in 1958, he was both manager and salesman. His only employees were Mary Coffman, a divorcee, who took care of the office work and two shipping clerks who handled the shipments. Because of her many years of employment, Mary knows from memory all the merchandise and prices as well as the customers and their credit ratings. Mr. Salter has complete confidence in Mary and has resisted all efforts to separate some of her duties, especially since she does not want to release any of her responsibilities, even though she often has to work overtime to keep up with her work load. Her son Don has worked as a shipping clerk for Acme for the past year and a half.

   A flowchart of the revenue cycle and explanation of the present system of internal control for Acme are presented on the following page.

   Audit Manager's evaluation: Weak
Weaknesses and strengths:

$W_1$ Mary Coffman has too many duties - she prepares sales orders, grants credit and checks her own work.

Possible errors or irregularities - errors on sales orders, fictitious customers, credit approval not independently checked.

No offsetting strength.

$W_2$ Mary's son in shipping.

Possible errors or irregularities - collusion between Mary and her son to fraudulently obtain company assets.

No offsetting strength.

$W_3$ Shipping clerks fill orders, prepare packing lists and also ship goods.

Possible errors or irregularities - shipping clerks could ship more goods than on sales order, ship without approval or ship to a fictitious customer.

Offsetting strength ($S_1$) - Typist compares sales order to packing list.
Sales invoices are not prenumbered. Numbers are assigned when they are typed.

Possible errors or irregularities - Failure to bill or record sales, duplicate billing and recording, loss of documents.

No offsetting strength.

Mary Coffman checks extensions and pricing.

Mary Coffman handles all exceptions to the system and the Accounting Department performs the same function as it does in the Top Value system.

Acme Household Appliances distributes a large variety of merchandise such as electric can-openers, micro-wave ovens and large refrigerator/freezers to retail stores in northeast Texas. An estimate of total sales invoices for this year would be about 18,000 invoices that range in amount from $125 to $15,000.

BASING UPON THE AUDIT MANAGER'S INTERNAL CONTROL EVALUATION AND THE ABOVE INFORMATION, CHOOSE PRELIMINARY SAMPLE SIZES FOR THE FOLLOWING TESTS:

**Compliance Tests**

1. Randomly select a sample of ____ sales invoices:
   a. to examine for supporting packing list and sales order.
   b. to determine that Mary Coffman has initialed to indicate performance of the required step of checking extensions.

   **Audit Objective:** to ascertain that recorded sales are for shipments actually made to nonfictitious customers, are for the amount of goods shipped and are correctly billed.

2. Review the file of numerical packing lists for ____ days to test numerical sequence.

   **Audit Objective:** to ascertain that all recorded shipments are in the file and that no packing list has been lost, misplaced or duplicated.
3. Select a random sample of _____ packing lists to test for proper initials as indication that shipping approval was checked.

Audit Objective: to ascertain that all shipments made were properly approved.

Substantive Tests

4. Randomly select a sample of _____ sales invoices:
   a. to check extension and footing totals.
   b. to compare billing price to authorized price lists.
   c. to trace the totals to the sales journal and accounts receivable ledger.

Audit Objective: to ascertain that existing sales are correctly billed and recorded.

5. Select a random sample of _____ packing lists:
   a. to be traced to the corresponding sales order and sales invoice.
   b. to be traced to perpetual inventory records.
   c. to determine that types and quantities shipped are types and quantities ordered and billed.

Audit Objective: to ascertain that the amount of goods ordered and billed were the amounts shipped and recorded in inventory records.

DEMOGRAPHIC INFORMATION

Age ____________________

Sex ____________________

College degree ____________________

College attended ____________________

Year graduated ________________

Grade point average __________

Auditing experience (years) __________

Current position ____________________

Presently employed by ____________________

Number of years with present employer __________
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