

THE ACQUISITION OF EXPERTISE IN AUDITING:
A JUDGMENTAL ANALYSIS

by

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TABLE OF CONTENTS

	Page
Introduction.....	1
Expert Judgment Research in Business.....	5
Focus on Validity.....	6
Optimal and Descriptive Approaches to Judgment.....	9
Acquisition of Expertise.....	12
What is an Audit?.....	16
Materiality and Expert Judgment Research in Auditing.....	20
Method.....	27
Overview.....	27
Participants.....	27
Stimuli.....	28
Design.....	30
Procedure.....	32
Task and Scale.....	33
Results.....	35
Experimental Task.....	36
Audit Partners.....	38
Audit Seniors.....	42
Auditing Students.....	47
Comparison of Auditors.....	49
Amount and Type of Informartion.....	50
Relative Importance of the Cues.....	51
Intra-Auditor Reliability.....	52
Inter-Auditor Consistency.....	53

Audit Opinions.....	53
The Concept of Materiality.....	54
The Use of Contextual Information.....	54
Inter-Auditor Agreement.....	57
Discussion.....	60
The Psychological Issues.....	60
The Expert Auditor.....	61
Comparison of Experts and Non-Experts.....	65
The Auditing Issues.....	68
The Role of Contextual Information.....	68
Inter-Auditor Consensus.....	70
Students as Surrogates.....	72
The Concept of Materiality.....	75
Research Limitations.....	77
Future Research.....	81
Conclusions and Implications.....	85
Professional Competence.....	85
Academic Training and the Acquisition of Expertise...	87
The Role of Contextual Information.....	90
Auditing as a Research Area.....	91
References.....	94
Footnotes.....	102
Tables.....	104
Figures.....	110
Appendices.....	114
A. Instructions and Practice Cases.....	114
B. Audit Case With All 'High' Levels of Cues.....	118

C. Audit Case With All 'Low' Levels of Cues.....	120
D. Actual Audit Case.....	122

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INTRODUCTION

The volume of psychological research dealing with expert judgment has rapidly increased during the last 15 years. This interest in the judgments or decisions by the expert may be, in part, a reaction to the recent advances in the sophistication of various disciplines--business, medicine, and law to name but a few. As these and other disciplines develop, we as individuals become more dependent on the judgments and decisions of these experts. Yet should this reliance on the expert be without reservation? Recent evidence suggests that the expert may use faulty judgmental strategies (e.g., rely on judgmental heuristics) which often result in judgments of questionable validity (e.g., Tversky & Kahneman 1974). In an attempt to understand and resolve this dilemma, much research has systematically examined the judgments of various experts to determine the particular judgmental skills/strategies which they use to make judgments.

However, given the recent interest by psychologists in the training of expertise (e.g., Goodman et al. 1976; Gaeth 1980; Phelps 1977;), an issue of perhaps more importance is the examination and understanding of how the experts' skills developed. One way to address this issue (and the

approach taken by this research) is to examine whether formal (i.e., academic) training alone is sufficient for one to acquire expertise. If not, how does practical working experience in a particular field provide the skills necessary for one to become expert?

Providing insights to these issues may be important for three reasons. First, and most important, answers to the above question will allow examination of the role that both academic training and practical working experience each have on the acquisition of expertise. Second, it will indicate some of the skills necessary for an individual to be labeled expert. Third, this in turn may have consequences for those wishing to train novices to acquire expertise. For example, careful examination of the manner in which 'expert' skills develop during professional experience may provide a useful framework or model to incorporate into a training program to train expertise.

The primary purpose of this research is to assess the relative contribution of academic training and practical working experience on the acquisition of expertise. To this end the research examines the judgmental skills and abilities (e.g., the judgment strategies used, the ability to distinguish between the relevance of numerous pieces of information, etc.) of individuals with varying levels of academic and professional working experience.

The present investigation examines the judgment

processes of individuals within a specific area of business -- auditing. In performing an audit the auditor must rely on his/her professional judgment and subjectively combine various items of information to arrive at a judgment. The particular judgments to be examined in this research are judgments of 'materiality' (discussed in detail below).

Judgments of materiality provide an interesting means by which to research the above issues concerning the acquisition of expertise for two reasons. First, the materiality concept is both heavily stressed in the academic training of professional auditors and used with great regularity in the professional auditors' everyday activities. Thus, it is quite reasonable to ask both students and professionals to make judgments of materiality to assess similarities and differences in their judgmental strategies.

Second, although the concept of materiality is ubiquitous in the accounting profession, it is neither clearly defined nor well understood, even by acknowledged experts. For example, Krogstad and Thomas (1979) cite over 250 separate references to the concept of materiality in the accounting literature, with no consensus as to how it should be used. Therefore, a secondary goal of this research is to apply a decision analysis to the study of auditors' materiality judgments in an attempt to understand how the professionals operationalize this concept.

Towards these ends, this research will examine if the judgmental strategy involved in making materiality judgments changes as an auditor gains professional experience. The specific levels of auditors used in this research are audit partners (the expert level), audit seniors (an intermediate level), and auditing students (the novice level).

Expert Judgment Research in Business

A great deal of interest has been generated both in psychology and in business in examining the decisions and judgments of individuals who may be considered expert in various business specialities. The judgments of stockbrokers, mutual fund managers, auditors, financial investors, etc., have become important since the 'information explosion' has made vast amounts of often elegant data available to these professionals. If good professional judgment is to result, and negative consequences resulting from misuse of information are to be avoided, this information needs to be interpreted and managed in a skillful manner. For example, stockbrokers are called upon to make accurate predictions and evaluations on the basis of a great deal of fallible information. Similarly, auditors must make use of enormous amounts of incomplete information to determine whether the financial statements of a corporation are accurately and fairly presented. Poor or misguided judgments by the stockbroker or the auditor can have financially damaging consequences ranging from the loss of a client to a major lawsuit by stockholders. Graham (1962) sums up this dilemma very well by suggesting that after one learns what information he/she can obtain and where to get it, he/she faces the tougher question of "what use to make of it!" (p.

85).

Focus on Validity. The early research examining judgments or decisions in a business setting focused on the issue of judgmental accuracy; ie., validity. It is interesting to note that many of these initial business studies examined the ability of acknowledged experts to predict trends in the stock market. This should not be surprising since the stock market readily provides an objective check for predictive accuracy.

One early and very extensive attempt to determine the accuracy of expert forecasting in the stock market was conducted by Cowles (1933). He examined the predictions of the 16 most successful financial investment companies and their ability to select stocks which would prove superior in investment merit. Cowles found their choices were worse than what could have been expected on chance alone. A follow-up study indicated a similar lack of accuracy in judgment, leading to the conclusion that these companies disclosed no evidence of skill in forecasting (Cowles, 1944).

The issue of validity in forecasting lay dormant for many years following Cowles' work. During the 1960's, however, some researchers in business began to investigate the issue of validity. Perhaps of some impetus to this was the warning of Gray (1966) who stated, "unless procedures within various business professions are developed for

measuring validity, such assessments will likely be imposed by those outside these professions" (p. 56). However, despite this warning there still have been relatively few attempts to assess the results of business decisions "in the harsh light of scientific scrutiny." (Slovic 1972, p. 781).

One of the recent studies investigating validity of business decisions was conducted by Treynor and Mazuy (1966), who examined the judgments of mutual fund managers who had promoted their services with the claim that they could anticipate major stock market movements. These researchers devised a statistical test of 57 mutual funds' historical success in anticipating major stock market turns between 1953 and 1962. Only one of the 57 mutual funds had a success rate that was better than what could be expected by chance. Similar disillusioning results were found by Craag and Malkiel (1968) who examined earnings projections for 185 corporations made by five different forecasting firms. Their results revealed low correlations (ranging from .07 to .16) between the predicted and actual earnings. Their results indicate that the judgments of these professionals by no means warrant claims of high predictive accuracy.

Although these results, with respect to accuracy/validity, are based on only a few studies, they suggest that the validity of experts' judgments in various business settings leaves something to be desired. However,

there may be two factors which contribute to this discouraging picture. The first is the almost exclusive use of the stock market as the criterion to assess predictive accuracy. The sporadic and uncertain nature of the stock market has led Treynor and Mazuy (1966) to conclude that perhaps no investor, professional or amateur, can outguess the stock market. The second factor, is the seemingly inherent nature of humans to be erratic or unreliable in their judgments (Slovic et. al., 1972). Since one could hardly expect 'erratic' humans to accurately predict a 'sporadic' stock market, the lack of accuracy evidenced in the research cited above should not be too surprising.

Golberg (1968) suggests that one consequence of this general lack of validity reported in expert judgment research was the shift in focus from the study of validity to the examination of the experts' cognitive processes (e.g., judgmental strategies, combination and use of information, etc.). To researchers wishing to conduct empirical research in areas where an external criterion was not available to assess validity (e.g., the stock market), this shift was necessary. That is, the judgments of experts in certain areas cannot be studied by examining validity. One such area is auditing. Very rarely if ever can the validity of an auditor's judgment be compared to some external criterion.

Therefore, examination of the cognitive processes of the auditor provides one meaningful manner to investigate expert judgment in auditing. Psychological researchers have typically used two approaches to investigate the cognitive processes of judges, whether in business or otherwise. What follows here is a description of these two approaches.

Optimal and Descriptive Approaches to Judgment

Researchers in the area of human judgment have utilized two general approaches to examine judgment processes; the optimal approach and the descriptive approach. Optimal models have been used extensively by researchers studying the processes of judgment; e.g., Bayes Theorem (Peterson & Beach, 1967), and multi-attribute utility theory (Gardiner & Edwards, 1975). These mathematical approaches to judgment may be termed 'optimal' models for they both have some common elements, namely: a) the use of some formal predetermined model which, b) breaks the judgments down into component parts, then c) uses as its input either statistical estimates or the judges' estimates of value of these component parts, and d) combines the data in some systematic manner according to the model so as to, e) produce or predict the "best" response that could be made. These optimal models have been utilized in a variety of applied situations ranging

from medical decisions (Schwartz, Gorry, Kassirer, & Essig, 1973), to weather forecasting (Winkler & Murphy, 1973), to air defense judgments (Edwards, Lindman, & Phillips, 1965).

However, there are some inherent limitations or drawbacks to this approach.

The most striking limitation, as indicated by Phelps (1977), is the rigidity in which the dimensions of information must be combined. This leads to a lack of flexibility in potential research designs which may in turn limit or handicap the utility of these approaches. That is, these models seem to guide the research, as opposed to the other way around.

In addition, it should be noted that obtaining judges' responses that are similar or identical to those of any one of the 'optimal' models does not necessarily allow one to infer that the cognitive processing used by the judge is similar or identical to the processes specified by the optimal model. If this is the case, these optimal models may actually hamper our understanding of the cognitive processes of the judge - "what he/she is actually doing" - and seem to be more concerned evaluating the judge against the 'norm' set by the model. In short, although this approach provides information on what people "are not doing" in making judgments, one is limited in drawing inferences as to what people "are doing" from such material.

The other general approach utilized by psychologists investigating the processes involved with expert judgment has a more descriptive emphasis as compared to the optimal approach discussed above. The descriptive approach breaks a judgment into component parts after a judgment is made. However, unlike the optimal approach which combines these components by some predetermined rule, the descriptive approach emphasizes identifying and describing the characteristics of a judgment and not determining the "best" response. With no optimal or 'correct' model to impose on the judge and his/her evaluations, the descriptive approach offers a useful method of describing and to some extent understanding a judge's cognitive processes. Although the results obtained by this approach often fit into one of a small number of decision rules, the rule is determined by the data, not by some predetermined model.

From the descriptive approach have emerged three techniques which have been used to study the judgment processes of experts: i.e., conjoint measurement (Krantz & Tversky, 1971), the len's model (Hammond, Hursch, & Todd, 1964), and information integration theory (Anderson 1974). These techniques have been extensively used in many areas of applied judgment research, ranging from radiologists (Hoffman, Slovic, & Rorer, 1968) and court judges (Ebbeson & Konecni, 1975) to soil scientists (Gaeth 1980) and policy

formation of handgun legislation (Hammond, et. al., 1975).

Although the approach taken by these studies differed in theory and execution, the ultimate goal is very much the same: to describe the judgment processes of the expert. For example, in examining stockbrokers' judgments of the earning potential of numerous common stocks, Slovic, et. al. (1972) found that the same technical information had very different effects on different stockbrokers' judgments. In short, the descriptive analytic approach to judgment focuses on 'what is going on in the experts mind'.

Although many of the above investigations using the descriptive approach have offered valuable insights into the judgment processes of various experts, they provide little information about the factors or conditions necessary for the acquisition of expertise. The present research uses the descriptive approach to examine the judgment processes of the expert and individuals with varying levels of experience. Thus, the particular manner in which certain judgment skills develop may be assessed. In short, the descriptive analytic approach is used as a tool to assess how expertise is acquired.

Acquisition of Expertise

Initially researchers in the realm of clinical judgment reasoned that the less-than-valid judgments made by clinicians could be improved with training. However, as

indicated by Goldberg (1968), an understanding of the processes involved with expert clinical inference would first be necessary. The same is thought to be true for other areas of expert judgment as well. For instance, Slovic (1969) indicates that understanding the cognitive processes of the expert may lead us to understand why some judges are more accurate than others, and this knowledge will, in turn, help train persons to make better decisions. In addition, researchers have attempted to understand and describe how an expert makes a judgment in agronomy (Gaeth 1980), medical pathology (Rossi & Madden, 1979), and meteorology (Winkler & Murphy, 1973) in the hope this understanding will, among other things, lead to some form of improved training in these areas. However, these studies may be limited in their ability to improve training since they focus only on the final product (i.e., the expert) of what would appear to be a lengthy and rigorous ordeal -- "becoming an expert". Thus, before better training procedures can emerge it is first necessary to examine how expertise is acquired. In particular, is academic training a sufficient condition for an individual to acquire expertise? And, if expertise is not obtained primarily through academic training, what role does practical working experience play on the acquisition of expertise?

The few studies which examined the effects of

training of any type seem less than informative in describing the role training has on acquisition of expertise; the training methods either consisted only of outcome feedback (Rorer & Slovic, 1966; Stael von Holstein 1972), or the tasks lacked relevancy for the subjects (Brehmer 1977). There was no research prior to 1977 which examined the effects of an academic training program on judgments in a natural (i.e., not contrived) setting and in which the task had relevance for the subjects.

In an attempt to fill this void, Phelps (1977) examined the role that academic training played on the acquisition of expertise in a unique area - livestock judgment. In addition, the judgmental abilities/characteristics that define a livestock expert were investigated. Her research is novel in that, unlike previous work, the particular training effects studied were neither tampered with nor contrived by the experimenter. What was examined were the effects of the on-going training program of the Animal Science Department at a major university for students wishing to become livestock judges. Her results indicate that increases in academic training are accompanied by increases in both the complexity of a judge's strategy and their consistency in responding. At the same time, the use of irrelevant information decreased with experience. In addition, it was revealed that students with the most training had judgment strategies

most similar to those of an acknowledged expert. Thus, Phelps (1977) was able to show, among other things, that a on-going training program and its effects on the development of expertise can be systematically studied in a meaningful manner.

However, it should be noted that although Phelps used a group of practicing livestock experts to compare with the students' judgments, no attempt was made to examine systematically the effect that practical working experience had on these livestock experts acquiring their particular brand of expertise. It seems unlikely that one's abilities and judgmental strategies in livestock judging, or any profession where expertise is involved, remain invariant after completion of academic training. It seems more likely that as one gains practical experience he/she would acquire additional skills and strategies. Thus it becomes of much interest to examine not only the effects of academic training, but also the role that practical working experience has on the acquisition of expertise. For example, it is possible that through practical experience one may learn new judgment rules. Conversely, one may learn to consistently apply old rules with increases in experience. Previous research provides little information on the role practical experience has on the acquisition of expertise. Examination of this issue would appear to be important for those wishing to improve training, be it at

the academic or the practical level.

The field of auditing provides a fruitful area to investigate this issue. The auditing profession provides a convenient organizational hierarchy in which to examine different levels of practical working experience. In addition, all auditors within an established firm, regardless of level, have received some academic (i.e., university) training.

What follows here is a description of the general nature of auditing, and an explanation of the concept of 'materiality' as it pertains to an audit.

What is an Audit?

To understand clearly what is implied by the term 'audit', it may be best first to state what an audit is not. Auditing is not accountancy, although they are related. The difference between accountancy and auditing is often not well understood even by many businessmen. A frequent misconception is that if accounts have been prepared by a professional accountant, this necessarily guarantees their accuracy. This however, is far from being the case. An accountant (expert or otherwise) merely prepares various financial statements/records to insure that various trial balances agree with the records from which they originate.

An audit is quite distinct from accountancy. An audit

does not entail the preparation of the account at all, but denotes a process of much wider breadth; namely the systematic examination of financial statements, records, and accounts prepared by others. As a result of this examination, an auditor must determine whether the records presented fairly represent the state of affairs of a particular company.

The general purpose of an audit of conventional financial statements has been stated in a report produced by Peat, Marwick, and Mitchell (1976) as, "the expression of an opinion on the fairness in which these statements present financial position, results of operations, and changes in financial position in conformity with generally accepted accounting principles" (p. 48).

The opinions or judgments of the auditor are of prime importance to individuals who have legitimate needs for such information for purposes of decision-making, such as stockholders or a bank issuing a loan. For instance, the verification of a company's financial position by a competent auditor might have a positive effect on a bank's decision to issue a loan to that company. Conversely, an auditor's judgment that the financial position is misrepresented might have an adverse effect on a bank's decision or on a stockholder's decision to hold on to his/her investment in that company. Clearly, in both cases, the opinion or judgment of the auditor concerning

the information provided by the auditee is important for various decision-making purposes.

These opinions/judgments made by the auditor are based both on numerous financial/quantitative aspects of a company (i.e., sales, earnings, net income, etc.), and on qualitative considerations such as management integrity, quality of internal control, management objectives, etc.. In addition, an auditor must also consider the economic conditions which pervade specific industries; e.g., industry trends, prime interest rates, etc.. But, there is no knowable "correct" answer. Thus, in performing an audit, an auditor must combine numerous items of diverse information into overall judgments/evaluations with no external or objective criterion. It is for this reason that a systematic examination of auditing judgments provides an interesting topic for psychological inquiry.

The Concept of Materiality.

It has been stated above that after examination of varied information, a professional auditor must combine this information into overall judgments. Of all the professional judgments an auditor will consider, the 'materiality' of various items or accounts is probably most crucial (Krogstad 1980). In any audit engagement, the level of materiality will determine the depth and extent of subsequent audit procedures. That is, judgment of an item as material will typically demand that the auditor(s) spend

further time and effort investigating the particular item of concern. Thus, the concept of materiality is of prime importance to the accounting profession.

Despite the importance of the concept of materiality, there presently exists no definitive operational definition by which to describe this concept. Unlike research in financial or investment forecasting, research in auditing cannot test the validity of one's materiality judgments vis-a-vis the "true" state of affairs in the real world.

The accounting profession has set forth specific rules or standards which hopefully provide guidelines by which an auditor can make accurate/informed assessments as to the degree of materiality of an item. Although the accounting profession has attempted to make these as precise and widely applicable as possible, each audit is unique and as a result these rules cannot always be applied in a straightforward fashion. That is, these guidelines cannot anticipate every possible auditing situation. Thus, when much diverse information becomes available to the auditor (as is the case in any audit), the utility of these rules or guidelines may lose their potency in the subtleties of the audit itself. Given the lack of an external criterion and, professional guidelines that are not always directly applicable, the evaluation of materiality by the auditor seems to become pretty much an educated 'judgment call'.

Although the validity of materiality judgments may not

be assessed externally, consensus between the judgments of acknowledged experts may provide a "standard" by which validity of such judgments may be assessed. In a practical sense this approach appears logical since the top expert (i.e., audit partner) has the authority and final say in the actual audit engagement. In addition, this type of standard has been used in previous auditing research (Ashton 1974; Moriarity & Barron, 1976), and other areas of expert judgment research as well (Phelps 1977).

One of the goals of this research is to assess the validity of the materiality judgments of individuals with varying degrees of professional and academic experience, using the judgments of expert auditors as a "standard". The effect of various auditing factors will also be investigated in an attempt to pinpoint any differences that may account for the consistency or lack of consistency in the materiality judgments of auditors with different levels of experience.

Materiality and Expert Judgment Research in Auditing

Most of the auditing research dealing with materiality has focused on the judgments of audit partners of major public accounting firms (Ashton 1974; Moriarity & Barron, 1976, 1978; Boatsman & Robertson, 1974). Accounting researchers have reasoned that the audit partner would prove most promising to investigate since they are

considered authorities in the accounting profession and their professional experience exceeds that of other CPA's.

An additional consideration is that there exists within the accounting profession a desire to aid the auditing researcher in investigations which may ultimately prove beneficial to the profession. Woolsey (1973) states, "the time has arrived when some action should be taken by our professional organizations to reduce the complexity caused by the materiality problem" (p 745). As a result, the professional auditor has generally been found to be a most willing participant in auditing research.

The initial research examining the concept of materiality focused on the degree of consensus which exists among professional in making materiality judgments. Woolsey (1954, 1973), for example, surveyed professional auditors in an attempt to identify common variables with which the individuals based materiality judgments. The findings from his studies indicates that there exists little or no agreement in the accounting profession in relation to which variables are relevant to decisions of materiality. Patillo and Seibel (1974) surveyed over 100 professionals to pinpoint factors affecting their materiality judgments. The researchers asked these professionals to identify factors that influence or enter into their materiality judgments in an area predesignated by the professional as being most deserving of future

accounting research. The basic conclusion is that professionals disagree as to which variables influence or enter into specific materiality judgments.

Bernstein (1967) states that in the accounting profession, where objectivity is of cardinal importance, the concept of materiality seems to be its "achilles heel". This same researcher goes on to conclude that the determination of materiality can be characterized as a "black box".

Despite the less than encouraging reports cited above, the amount and quality of research examining the materiality judgments of expert auditors has advanced considerably. Some researchers (Moriarity & Barron, 1976, 1978; Newton 1977; Meisser 1980) have attempted to account for this apparent lack of consensus by empirically deriving the variables important to materiality decisions. For example, Frishkoff (1970) was able to identify three factors which affected materiality decisions and provide an average relative importance for each factor in discriminating between items actually classified as material or not material. Boatsman and Robertson (1974) using eight auditing variables constructed a mathematical model to describe the manner in which "knowledgable" auditors believed materiality judgments ought to be made. This model revealed a reasonably high degree of agreement when compared to the auditor's actual materiality

judgments.

While the above research has contributed considerably to our knowledge of the factors considered important by auditors in making materiality judgments, the research suffers from two deficiencies which make generalizations difficult. First, the auditor participants in prior research generally have been selected with little regard for the nature or extent of their auditing experience. This relative lack of homogeneity in auditing experience may to some degree account for the results of previous research reporting low consensus between judgments and different variables being used in making materiality judgments (eg., Moriarity & Barron, 1976, 1978; Woolsey 1973; Patillo & Seibel, 1974). Auditors at differing positions/levels in an accounting firm may be likely to have differing strategies and considerations in completing a specific auditing task. Moriarity and Barron (1976) suggest that more homogeneous results might have been obtained in their study had the participants been more similar in position and experience. This suggests that it is important to control for auditing background in selecting auditors for research.

In an attempt to address this issue, Hoftstedt and Hughes (1977) investigated the materiality judgments of MBA students, who might be considered 'homogeneous' in their experiences in dealing with auditing situations. Contrary

to the notions of Moriarity and Barron (1976), Hoftstedt and Hughes' (1977) results indicate widespread individual differences in the manner in which these MBA students made materiality judgments.

In a more recent study, Hamilton and Wright (1980) examined the internal control judgments of auditors, specifically investigating the relationship between consensus, self-insight, and auditing experience. These researchers hypothesized that a positive correlation would exist between years of auditing experience and the above judgmental considerations. Their results showed no relationship between experience and consensus, although a significant correlation did exist between self-insight and experience. These results may stem partly from the fact that Hamilton and Wright (1980) controlled for experience by considering only years of experience, as opposed to considering their position in their firm. Although individuals with the same amount of auditing experience are more likely to hold a similar professional position, this is not necessarily the case. The possibility exists that individuals with the identical number of years of auditing experience may hold very different positions within a firm. The demands of a particular position may cause an auditor to have different considerations in completing the experimental task. This may account for some degree for the lack of a relationship between experience and

consensus.

The present research controls for auditing experience by considering in the research design three groups of participants: auditing students, audit seniors, and audit partners. Thus, experience will be accounted for by the particular level within an accounting firm and not the number of years of auditing experience exclusively.

The second deficiency is inherent in almost every auditing study cited above and may cause difficulty in generalization. Most judgmental research in auditing has exclusively incorporated in their research design financial information such as earnings per share, earnings trend, and the current ratio. Such 'quantitative' information may be central in making judgments of materiality. However, in making these materiality judgments auditors' may consider other types of 'contextual' factors as well: industry trends, quality of internal control, management cooperativeness, expected users of the financial report, and management's accounting policies, to name a few. Moriarity and Barron (1978), whose research design incorporated only financial cues, state:

most participants indicated that they would be more familiar with the operations of thier client: e.g., th type of management and management objectives. Thus, some of the participants said they would have liked to

have known what industry they were dealing with, to whom the audit report would be distributed and what kinds of audit problems had been experienced in the past (p. 21).

Thus, although the auditors in previous judgment research completed the experimental tasks as best they could, they did so in the absence of contextual information which are typically the "givens" in an audit. The absence of contextual information may well have introduced artificiality into the previous experimental research. One might speculate that this artificiality contributed to the inconsistent results obtained in the above research. That is, completing a familiar task (i.e., dealing with financial information) in an unfamiliar context, or no context at all, may cause various auditors to adjust their strategies or mental frameworks in very personal, idiosyncratic ways. Accordingly, it seems desirable to include contextual information when investigating the materiality judgments of professional auditors (Thomas & Krogstad, 1979).

The present research includes contextual variables systematically in the research design to add both a degree of realism to the experimental task and to examine the effects contextual information has on judgments of materiality.

METHOD

Overview

The auditor-participant's general task in this study was to evaluate the level of materiality in various hypothetical auditing cases. The basic design of this study is a 3×2^8 fractional factorial. The two main factors are 1) experience of the auditor-participants (3 levels), and 2) 8 auditing cues (at 2 levels each).

Participants

This experiment utilizes three different groups of participants, each varying in the degree of experience and expertise in auditing. The first group is composed of 11 accounting majors at Kansas State University who had completed at least one, but no more than two formal classes in auditing by the time they participated: this group will hereafter be known as "the students". They had no practical experience working as an auditor and thus they are considered as representing a sole "academic" approach to accounting.¹

The second group is composed of 11 audit seniors from six Big-Eight accounting firms in Omaha, Nebraska. They have had more than two but less than four years of professional working experience: this group will be known as "the seniors".² These audit seniors have the responsibility for actually conducting the audit at the

auditees place of business. In addition, they represent the initial level within an accounting firm where materiality decisions are made. It should be noted that the Big-Eight firms comprise the eight largest and most respected accounting firms in the country.

The third group was composed of 10 audit partners of six Big-Eight accounting firms in Omaha, Nebraska. This group will be known as "the partners". Their professional experience ranged from 8 to 27 years. The audit partner represents the highest professional level within an accounting firm where materiality decisions are made, i.e., the review level. As mentioned earlier, they are considered 'expert' within the accounting profession.³

Stimuli

The stimuli utilized in this research were hypothetical auditing cases composed of 8 auditing cues, with each cue varying across two levels. These 8 cues may be divided conceptually into two groups: the first group consists of five 'nonfinancial' or contextual cues. The second group consists of three 'financial' cues.

The two levels of each of the five 'contextual' cues are as follows: 1) a nondiversified firm in a declining industry vs. a diversified firm in an expanding industry; 2) a publicly held corporation with stockholders being the primary users of the financial statements vs. a closely held private corporation with creditors being the primary

users of the financial statements; 3) a management which is completely cooperative and open in all dealings with your firm vs. a management which is less than completely cooperative and open in all dealings with your firm; 4) a management that follows conservative accounting policies vs. a management that follows unconservative accounting policies; and 5) the presence of strong internal control procedures vs. the presence of inadequate internal control procedures.

These five contextual cues have been specifically mentioned in the accounting literature (Moriarty & Barron, 1976, 1978; Meisser 1980; Hoftstedt & Hughes, 1977) as being important components that an auditor may consider in making materiality judgments. Earlier research lacked such contextual cues in their stimuli and as a result failed to provide auditors with potentially important background information. The inclusion of these cues makes the present experimental task more realistic and permits analysis of the role such information plays on auditors' judgments of materiality.

The three 'financial' cues also contain two levels each: 1) effect of the proposed adjustment on the current ratio (a reduction of 2.6 to 2.1 vs. a reduction of 2.1 to 1.7), with 2) effect of the proposed adjustment on net income (a decrease of 2.7% vs. a decrease of 7.3%), and 3) the effect of the proposed adjustment on the

earnings-per-share (EPS) trend (no reversal of prevailing EPS trend vs. reversal of prevailing EPS trend).

These three cues were included in the research design on the basis of a review of the literature in the area of materiality judgment. For example, Moriarity and Barron (1976) suggest that these cues are necessary in order to make an informed materiality judgment. On the basis of pilot testing, Krogstad (1980) maintains that the particular levels presented for the three financial cues may be dichotomized into 'high' and 'low' levels. (see the appendix for a listing of the 'high' and 'low' levels for all 8 cues, and an illustrative case) Finally, auditor-participants were presented with a post-experimental questionnaire that gave them the opportunity to provide feedback on the research project. Such feedback is especially important since it helped with the interpretation of each auditor's results. In addition, it provided suggestions for improvements in the design of future studies. (see the appendix for a copy of the post-exeriemtnal questionnaire.)

Design

The present research consisted of 9 factors: the first being a between-subject variable of auditing experience. The remaining 8 factors being within-subject variables of auditing cues. The exact combination of levels was specified by a fractional factorial design (Hahn & Shapiro,

1966; appendix i; p. 5; plan 7b).

Pilot work with both students and practitioners indicated that approximately three minutes is needed to complete each auditing case. Therefore, a $1/16$ fractional factorial design consisting of 16 cases with a full replication (32 cases in all) appeared reasonable. A complete replication was desirable because it permits estimation of the consistency of each auditor-participant. It should be noted that if the full factorial design were used, it would be necessary for the participants to complete 256 auditing cases.

The cost of using this fractional factorial design is that it is not possible to estimate all of the higher-order interaction terms; they are confounded with main effects and some two-way interactions. However, this does not create a significant disadvantage in the interpretation of results since the focus of this research is on the importance and use of cues as indicated by main effects. In addition, Goldberg (1968) has suggested that such higher-order interactions (i.e., three-way, four-way, etc.) are generally negligible and difficult to interpret. Nevertheless, it was possible to examine some specific two-way interactions, which will most likely indicate the presence of any configural cue usage (Krogstad, 1980). Such interactions were of particular interest in determining if the auditors are using the information in a

linear fashion or not.

Procedure

The basic procedure consisted of four steps: 1) the purpose of the research, detailed instructions, and example cases were presented to each auditor. Particular emphasis was placed on explaining the task and response measure. 2) each auditor-participant was asked to judge some practice cases. This was to insure that all participants, especially the students, had an adequate understanding of the procedure (see appendix for a set of instructions and practice cases). 3) the main set of 32 auditing cases (16 presented twice) was then presented. 4) Finally, the post-experimental questionnaire was presented to each auditor to determine his/her reactions and suggestions.

The specific procedures implemented for the students and practicing auditors were, of necessity, somewhat different.⁴ The students were contacted through an upper-level auditing course at Kansas State University during the final weeks of the spring 1980 semester. Each student was individually presented with the four steps of the above basic procedure. When the task and post-experimental questionnaire were completed, the student was debriefed and paid for his/her participation.

The audit seniors and audit partners were initially contacted through partners-in-charge of their respective accounting firms. After the initial contact, appointments

were set up at the auditors' offices. For these two groups only the first two procedure steps (task introduction and practice cases) were completed during the initial meeting, which took place in either June or September of 1980. These "practice" sessions lasted approximately one-half hour and were attended by two to six auditors at a time. Once the auditors showed a clear understanding of the task involved, they were each handed the entire set of 32 auditing cases and asked to complete these cases within three weeks. The auditors were instructed to treat each case independently and not to refer back to previous cases already completed. Upon receiving the completed auditing cases from the auditors, post-experimental questionnaires were mailed.

Task and Scale

Each participant was asked to rate the level of materiality or immateriality given the following instructions:

You are to place yourself in the position of the auditor in charge of the hypothetical auditing engagements that follow. The following information is applicable to all cases:

- 1) The financial statements are being audited by your firm for the fourth consecutive year. Unqualified opinions have been issued for each of the preceding three years. Net income after taxes (per company books) is 6,226,000 for the current year.
- 2) Normal economic conditions prevail: real GNP at 4%, inflation rate at 8%, prime interest rate at 10%, Dow Jones Industrial average at 950, and New York Stock Exchange price-earnings ratio at 11.⁵

Normal audit procedures lead you to believe that the year-end "allowance for doubtful accounts" should be increased. Examine carefully the data presented for each case and respond thoughtfully to the questions listed below the data. Each case should be considered independently of all other cases.

Thus, for each auditing case presented, the auditor was requested to indicate the relative materiality or immateriality of the proposed adjustment to the "allowance for doubtful accounts", based on the eight auditing cues. Ratings were made on an unmarked 100 mm. line of which the ends were defined as "clearly immaterial" (0) and clearly material" (100).

In addition, for each case participants provided an audit opinion (qualified, unqualified, or adverse) with regard to the proposed adjustment. Thus, consistency of the opinions between and within the groups could be assessed.⁶

RESULTS

The results section is organized in the following manner: the experimental task is first examined to determine whether it allows the participants to respond in a meaningful manner. Next, some skills/abilities that characterize auditing expertise are examined. That is, 1) the amount and type of information used in forming materiality judgments, 2) how this information is combined, and 3) the manner in which the expert distinguishes among the relevance of numerous pieces of auditing information. In addition, the degree of both intra-auditor consistency (i.e., reliability) and inter-auditor consistency (i.e., consensus) among the partners is examined to determine how expert auditors compare to other types of experts on these issues of consistency. Examining the degree of consensus among the partners will also determine whether there exists a "standard" with which to assess the judgments of both the auditing students and audit seniors.

The manner in which each of the less experienced audit seniors and auditing students made their materiality judgments is then examined, with specific focus on the three research issues described above regarding the audit partners' judgments. This is followed by an examination of the similarities and/or differences in the way that the

seniors as a group and the students as a group made judgments of materiality relative to the "standard" provided by the partners. This will allow a comparison of some skills and abilities acquired during formal training with those acquired during practical working experience.

The concept of materiality is then examined with specific emphasis on the use of financial and contextual information.

Experimental Task

An initial consideration was the ability of the auditor-participants (i.e., students, seniors, and partners) to discriminate systematically among the 32 audit cases. One would expect that an auditor-participant who is sensitive to changes in the experimental stimuli would respond differentially to cases which differ as to the mix of stimulus cues. Examination of the the materiality ratings of each auditor-participant clearly indicated an ability to recognize the two extreme cases; i.e., those containing all high or all low cue levels. Likewise, different combination of stimulus cues received differing materiality ratings. An analysis of variance performed on the materilaity judgments of all participants indicates that the audit cases are different, ($F(15,435)=57.03$, $p<.01$). This general agreement as to the extreme cases and the differential effect of various cue combinations strongly suggests that the participants were able to

respond differentially to the experimental task.

Each participant was required to complete a full replication of the 16 audit cases. Thus, correlations were computed between each participant's judgments on the replicates of the 16 audit cases to obtain a measure of judgmental consistency (i.e., intra-auditor reliability). The average correlation across all 10 partners was .83, with a range of .61 to .94; for the 11 seniors the average correlation was .76 with a range of .57 to .96; and for the students the average correlation was .66 with a range of .44 to .83. The high degree of consistency exhibited by the partners and the seniors indicates that they were able to substantially duplicate their determination of materiality of identical auditing cases. On the other hand, the students intra-auditor reliabilities indicated only moderate agreement between their responses on the two replicates of audit cases.

These results are important for two reasons. First, they lend further support to the notion that the task and response measure allowed the participants to respond in a meaningful manner. Secondly they suggest that the partners and seniors may have been applying what seems to be a consistent strategy throughout the cases. The students' strategy, however, appears less consistent (this issue is elaborated below).

Audit-Partners

To examine the type and amount of information used by the audit-partners (i.e., the experts) a separate analysis of variance for the fractional design was performed for each partner. This analysis indicates that for the partners the average number of cues (main effects) significant in determining materiality was 3.3 (out of a possible 8). Table 1 shows the F values for the 8 cues and 5 2-way interactions for each of the 10 partners.⁶

As can be seen in Table 1, the number of significant cues for the partners ranged from 1 to 6 indicating that different partners apparently used different amounts of information when determining materiality. One striking similarity is the significant effect of cue #7 (effect on net income) to all 10 partners' judgments of materiality. This suggests an overall agreement among the partners that the 'effect on net income' is significant in determining materiality.

There appears to be no agreement however, as to the significance of other information when determining materiality. Closer examination of Table 1 also indicates that little agreement exists among the partners as to the type of cues (financial vs. contextual) to be used in determining materiality. While none of the partners used only contextual information when determining materiality, four partners used only financial information, while the

remaining six used both financial and contextual information. Thus the only agreement among the partners seems to be that the effect on net income is necessary for the determination of materiality (this issue is pursued in greater detail below). Given the relatively few significant 2-way interactions for all the partners (2 out of a possible 50), the audit partners seem to combine the information in a fashion consistent with a linear combination rule.

Although the F values allow determination of the significance of a cue or interaction of cues to judgments of materiality, they are not a good measure of the relative importance of any of these cues. To examine the relative importance of each auditing cue, Hays' (1963) omega squares (w^2) were computed for each of the audit partners. Table 2 shows the w^2 values for the 8 cues. As can be seen, a sizable amount of the total variation in the partners' materiality judgments can be accounted for by the sum of the w^2 values for the main effects; the mean of this sum is 79.6, with a range of .57 to .92. Only two interactions (out of 50) accounted for more than 1% of the overall variation for any partner; the cue #7 x cue #8 interaction for partner #6 (4%) and the cue #1 x cue #7 interaction for partner #18 (2%).

Again, cue #7 (effect on net income) provides a most interesting result. Relative to all other auditing

information the proportion of variance accounted for by cue #7 was by far the largest; the average w^2 value for this cue across all 10 partners is .62, with a range of .28 to .90. This overwhelming impact of the effect on net income holds true regardless of the amount of information significant to the determination of materiality. For example, although partner #18 has 5 significant cues which account for 86% of the variance in his/her materiality judgments, the effect on net income alone accounts for 76% of this overall variation. The next highest w^2 value for partner #18 is 4% for cue #3 (management cooperativeness). Similarly, of the 55% of the variation in partner #16's judgments (a relatively low total compared to the other partners), 50% of the overall variation is accounted for by the effect on net income. This same pattern of overwhelming impact with regard to cue #7 is evidenced for all other partners.

These results should not imply, however, that in determining materiality, all the partners focused only on cue #7 while the other 7 auditing cues were ignored. In fact, closer examination of the results suggest otherwise. For example, the total amount of variation accounted for by partner #6's other two significant effects (38%) was almost as great as the variance accounted for by that of cue #7 (42%). A similar pattern can be seen for the judgments of

partner #20; cues 2, 4, 5, and 8 account for 35% of the overall variation whereas cue #7 accounts for 28% of this same variation.

It should be noted that many of the cues were statistically insignificant to the determination of materiality. This suggests that the partners were apparently able to disregard information as well (see Table 1). More specifically, each of the 10 partners had at least 2 cues (out of 8) that did not account for more than 1% of the total variation in their materiality judgments. It may thus be concluded that the audit partners have the ability to focus on the relevant aspect(s) of the particular task at hand (e.g., cue #7) while paying less attention to, or ignoring, the information they deem as not relevant.

With regard to inter-auditor agreement (i.e., consensus) correlation coefficients were computed between all 10 partners judgments of materiality. These results suggest a high degree of consensus between the materiality judgments of the partners; the average correlation across all 10 partners was .74 with a range of .55 to .93. In addition, all the correlation coefficients were statistically significant ($p < .05$). Thus, the partners not only concur as to the significance of cue #7, but also have general agreement as to the relative degree of materiality represented in each of the auditing cases.

In summary, the above results suggest that each audit partner is able to distinguish between the relevance of various auditing information and focus primarily, but not exclusively, on one cue (i.e., the effect on net income) when making materiality judgments. Each partner also made their judgments in a consistent fashion. In addition, it seems that the combination rule used by each audit partner is consistent with a linear (main-effects only) one.

The high inter-auditor consistency suggests that as a group the audit partners use a similar strategy when determining materiality in this task. Thus, they appear to provide a "standard" by which materiality judgments may be assessed. This strategy does not entail the use of all available information, but instead almost invariably revolves around the effect on net income (cue #7), with other auditing information causing minor adjustments in the determination of materiality.⁸ However, there is little agreement as to what "other" information is significant in determining materiality. After cue #7 is considered, the number, type, and impact of the remaining information varies from partner to partner.

Audit Seniors

A separate analysis of variance of the fractional design was performed for each of the 11 audit seniors to determine the amount and type of information used in their

determining materiality. The average number of cues significant for the seniors in determining materiality (as indicated by significant main effects) was 2.9 (out of a possible 8). Table 3 shows the F values for the 8 auditing cues and the 5 2-way interactions for each of the 11 seniors.

One notable result is the significant effect of cue #7 (effect on net income) on all 11 seniors' materiality judgments. This suggests an overall agreement by the seniors that the 'effect on net income' is significant in the determination of materiality. There appears to be no agreement, however, as to the significance of other information when determining materiality. As can be seen in Table 3 the number of significant cues for the seniors ranges from 1 to 6, indicating that different seniors use different amounts of information when determining materiality. Closer examination of Table 3 also indicates that there exists some agreement among the seniors as to the type of information (financial vs. contextual) to be used in determining materiality. Although none of the seniors used only contextual cues when determining materiality, 2 of the seniors relied solely on financial cues, whereas the remaining 9 seniors used both financial and contextual information when determining materiality. Thus, financial information (specifically cue #7) seems relevant to determining materiality, while most seniors

concur that some contextual information is necessary as well.

Omega squares (w^2) were computed for each of the audit seniors judgments to examine the relative impact (i.e., proportion of variance accounted for) of each auditing cue and interaction of cues. Table 4 shows the seniors' w^2 values for the 8 auditing cues. Relative to all other auditing information used by the seniors, the proportion of variance accounted for by cue #7 was by far the largest; the average w^2 value across all 11 seniors was 56%, with a range of 32% to 87%. This overwhelming impact of the effect on net income holds true regardless of the amount of information significant for a seniors' determination of materiality. For example, although senior #24 has 6 significant main effects which account for 88% of the variation in his/her judgments, the effect on net income alone accounts for 80% of this overall variation. The next largest w^2 value for senior #24 is 3% for cue #6 effect on current ratio. Similar proportions were obtained for senior #8; the main effects account for 76% of the overall variation, with cue #7 accounting for 56% of this variation. This same pattern of overwhelming impact with regard to cue #7 is evidenced for all other seniors. In addition, Table 4 indicates that a sizable amount of the total variation in the seniors' judgments can be accounted for by the sum of the w^2 values for main effects; the mean

of this sum is 71%, with a range of 45% to 90%. Given the relatively few significant interactions (5 out of a possible 55) and their minimal w^2 values (only 3 of 55 accounted for more than 1% of any seniors overall variation), these results suggest that the audit seniors combine the information by a rule consistent with a linear one.

The seniors also show an ability to examine the information and pinpoint the relevant aspect(s) of the task (i.e., cue #7), while ignoring the information they considered to be not relevant; many of the cues were statistically insignificant to the seniors' judgments of materiality. However, as was the case with the partners, the seniors did not focus only on cue #7; they considered other auditing information as well when determining materiality. For example, senior #4 had cue #8 (effect on EPS trend) account for a sizable amount of variance (.25) relative to the amount accounted for by cue #7 (.40). With the exception of senior #12, all of the remaining audit seniors had other auditing information (i.e., aside from cue #7) account for some degree of variability in their materiality judgments.

With regard to inter-auditor agreement (i.e., consensus), correlation coefficients were computed between all 11 seniors judgments of materiality. These results suggest a high degree of consensus between the seniors'

materiality judgments; the average correlation across the judgments of all 11 seniors was .67, with a range of .44 to .91. In addition, all the correlation coefficients were statistically significant ($p < .05$). These results indicate a general agreement among the partners as to the relative degree of materiality represented in each of the auditing cases.

In summary, the above results suggest that each audit senior is able to distinguish between the relevance of various auditing information and focus primarily on one cue (the effect on net income) when making materiality judgments. Each senior also made their judgments in a consistent fashion. In addition, the combination rule used by each audit senior appears to be a linear one.

The above results also suggest that as a group the audit seniors use a similar strategy when determining materiality in this task. This strategy does not entail the use of all available information, but instead almost invariably revolves around the effect on net income (cue #7), with other information causing minor adjustments in the determination of materiality (see footnote 8). However, among the seniors there is little agreement as to what "other" information is significant or relevant in determining materiality. After cue #7 is considered, the number, type, and impact of the remaining information varies from senior to senior.

Auditing Students

To determine the amount and type of information used by the 11 students, a separate analysis of variance of the fractional design was performed on each of their judgments of materiality. Table 5 shows the F values for the 8 auditing cues and the 5 2-way interactions for each of the 11 students. The average number of cues (main effects) significant in determining materiality for the students was 2.6 (out of a possible 8), with a range of 1 to 5.

Closer examination of Table 5 indicates that no one cue was significant to all 11 students' judgments of materiality; cue #7 (effect on net income) was significant to 8 of 11 students' judgments, while cue #3 (management cooperativeness) and cue #4 (type of accounting policies) were each significant to 6 students' judgments. These results suggest that for the students there exists no consensus as to what should be significant in the determination of materiality. The results in Table 5 also indicate little agreement as to the type of information (financial vs. contextual) to be used in determining materiality (this issue is pursued in greater detail below).

w^2 values were computed to determine the particular manner in which each student used the auditing information. Table 6 shows each students w^2 values for the 8 auditing

cues. The lack of general agreement as to the importance of any of the auditing information is striking. For instance, it can be seen that cues # 2, 3, 4, 5, 7, and 8 each accounted for the largest proportion of variance in the materiality judgments of at least one student. It can also be seen in Table 6 that no one cue dominated the judgments of any student; i.e., numerous cues received relatively sizable w^2 values. For example, for student #6 the proportion of variance accounted for by cue #2 (type of company) and cue #8 (effect on EPS trend) was 29% and 26% respectively. Students # 5, 7, 10, and 11 exhibit similar w^2 patterns with different cues. Student #1's judgments provide an interesting extreme case; cue #7 (effect on net income) and cue #8 (effect on EPS trend) both account for an equal amount of variance, 41%. These results suggest that as a group the students do not concentrate on any one cue in particular, but rather spread their focus over numerous cues, attempting to incorporate them all in their judgments of materiality.

Examination of Table 6 also indicates that a good portion of the variation in most students' judgments may be accounted for by the sum of the w^2 values for main effects; the average of these sums is 60%, with a range of 32% to 85%. However, there seems to be some indication of configural processing on the part of some students. Student #8, for example, had an almost equal amount of variance

accounted for by the interactions (19%) as compared to those of main effects (21%). Other students exhibit some configural cue use as well; the cue #5 x cue #7 interaction accounts for 11% of the total variation in student # 2's judgments while the cue #7 x cue #8 interaction accounts for 10% of the variation in student #3's judgments. Thus the particular combination rule used by the students as a group is not clear. While it seems likely that most students combined the information in a fashion consistent with a linear rule, there is some evidence for configural cue usage by some students.

With regard to inter-auditor agreement (i.e., consensus) correlation coefficients were computed between all 11 students judgments of materiality. The average correlation across all 11 students judgments was .41, with a range of .08 to .78, indicating at best only moderate agreement between the students.

In summary the above results suggest that the students desire to include numerous pieces of information when determining materiality. However, the above results suggests little agreement exists among the students as to either what should be used in determining materiality or how this information should be used.

Comparison of Auditors

This section compares some aspects of the manner in

which the audit partners (i.e., the experts) made materiality judgments to how these same judgments were made by the non-experts (i.e., the seniors and the students). The judgments of the audit partners will provide the point of reference (i.e., the "standard") with which to make these comparisons. In addition, the audit opinions issued by the three groups is compared.

Amount and Type of Information. The mean number of cues used by each group of auditors indicates an interesting trend, partners =3.3, seniors =2.9, and students =2.6. However, these differences did not reach significance ($p > .05$). Thus, while there is a trend, the difference between the experts and non-experts is not significant.

The analyses of variance of the fractional design reported above for the participants in each group revealed little or no consensus as to the amount of information to be used in determining materiality. Participants in each of the three groups varied as to the number of cues used in making materiality judgments. For instance, at least one individual from each of the three groups used as little as 1 cue when determining materiality, whereas as many as 5 cues were used by at least one individual from the same three groups.

There appears to be little difference between experts and non-experts with regard to the type of information

(financial vs. contextual) used in determining materiality. Some partners used both financial and contextual information when determining materiality, while others relied solely on financial information. Similar patterns are seen for both the seniors and the students, with the possible exception of students' # 2, 8, and 11 who relied solely on contextual information when determining materiality.

With regard to the specific auditing information used by the partners, the effect on net income (cue #7) merits special consideration. Aside from this piece of information, no other cue was significant to all 10 partners' judgments. As can be seen in Table 3, all 11 seniors used cue #7 to determine materiality. Examination of Table 5 however, reveals that some of the students failed to use this piece of information. Thus, to some degree the students differ from professional auditors with regard to the specific information used in determining materiality.

Relative Importance of the Cues. Figure 1 shows the w^2 values for each cue averaged over the participants in each of the three groups. Virtually no differences are seen in Figure 1 when comparing the average w^2 values of the audit seniors with those of the audit partners. Each of these two groups focused on information in a similar fashion. The seniors have the largest w^2 value for cue #7

with other information causing only minor adjustments in the judged degree of materiality. Thus, with regard to the relative importance of the auditing information, the seniors seem to agree with the partners in an almost uniform manner.

As can be seen, the auditing students differed in their use of the auditing information. The students tended to spread their attention over many of the auditing cues as opposed to focusing on the effect on net income (cue #7). For instance, cues # 4, 5, and 7 received comparable w^2 values for the students as a group (11%, 12%, and 18% respectively). Although the students did place most impact on the same cue as did the audit partners (i.e., cue #7), they seemed unable to focus primarily on this one relevant cue, instead incorporating other auditing information as being of near equal impact. In addition, as indicated earlier the particular combination rule used by the students as a group is not easily identifiable. Some students appear to use a simple linear combination rule while others seem to use some form of configural processing.

Intra-Auditor Reliability. The average test-retest correlations for each of the three groups are as follows; audit partners = .83, audit seniors = .76, and auditing students = .66. No significant difference in reliability was found between the partners and the seniors ($p > .05$).

However, significant differences were found between the audit partners' reliability as compared to the students ($t=3.07$, $p < .05$), and between audit seniors and the students ($t=1.88$, $p < .05$). Thus it appears that the students respond less consistently to the task than the professional auditors.

Inter-Auditor Consistency. Correlation coefficients were computed within auditor-participants in all three groups to examine the degree of consistency (agreement) between auditors with varying levels of experience. The average inter-auditor correlations within the three groups is as follows; partners = .72, seniors = .67, and students = .41. An analysis of variance performed on these means was significant, ($F(2,152) = 83.54$, $p < .05$). A Neuman-Keuls analysis revealed no significant differences between the degree of consensus of the partners and the seniors, whereas significant differences were found between the partners and the students and the seniors and the students. Thus, the students seem to have less agreement among themselves relative to the degree of materiality as compared to the professional auditors.

Audit Opinions. After determining materiality in each case, the participants were required to issue an audit opinion. Although the primary purpose for including these opinions was to ensure the materiality judgments obtained were of the same type (see Footnote 6), comparisons were

made of the opinions issued by the three groups.

The partners' opinions seemed to vary as a function of the level of cue #7. When cue #7 was high (2.7 reduction in net income), the partners issued qualified opinions 97% of the time. However, when the level of cue #7 was low (7.3 reduction in net income) unqualified opinions were issued 41% of the time. Similar results were revealed for the seniors; unqualified opinions were issued 79% of the time when cue #7 was high, and 16% of the time when cue #7 was low.

The students', however, were more cautious than the partners or the seniors with regard to issuing unqualified opinions. When cue #7 was high unqualified opinions were issued only 30% of the time, whereas when cue #7 was low unqualified opinions were issued 16% of the time. In fact, no one cue dominated the opinion issued by the students. These results suggest that regardless of the level of information presented the students had a tendency to be risk-adverse and issue qualified opinions. In short, the students issued audit opinions differently than the professional auditors.

The Concept of Materiality

The Use of Contextual Information. The manner in which contextual (i.e., nonfinancial) information was used in determining materiality can be examined at three levels;

the number of auditor-participants in the three groups using contextual information, the number of specific contextual cues used by each auditor-participant, and the importance of contextual information in the determination of materiality. Each of these three are considered below.

The analysis of variance of the fractional design reported earlier, indicates that 75% of all the auditor-participants made use of some contextual information when determining materiality. Tables 1, 3, and 5 show the specific auditor-participants who used this information; i.e., cues # 1 through 5. As can be seen 6 out of 10 partners, 8 out of 11 seniors, and 10 out of 11 students had a significant effect for at least one contextual cue. This suggests that for a majority of the auditors in all three groups, some contextual information was necessary for determining materiality.

The average number of cues significant for each of the three groups was as follows; partners = 3.3, seniors = 2.9, and students = 2.6. On the average, the partners used 1.7 contextual cues when determining materiality as compared to an average of 1.6 of the financial cues. The seniors on the average used 1.55 contextual cues and 1.27 financial cues. The students used 1.64 contextual cues on the average as compared to 1.00 financial cues. Although the average number of contextual cues used by each of the three groups of auditor-participants exceeded the average number

of financial cues used, this result should not be seen as of any great significance since the differences are not that great and there were five contextual cues presented with each case as compared with only three financial cues. Of greater importance is the result that on the average all three groups used some contextual information when determining materiality.

Relative to the specific contextual information significant for determining materiality, there appears to be little agreement both within and between the three groups. Cues # 2 (primary users of the financial report) and 4 (type of accounting policies) were each significant to the judgments of 4 out of 10 partners, cue # 1 (type of industry) was significant to 5 out of 11 seniors' judgments, while cues # 4 (type of accounting policies) and #5 (quality of internal control) were each significant to six out of 11 students.

Examination of the partners' w^2 values for both contextual and financial cues (see Figure 1) reveals that contextual information played a relatively minor role in determining materiality as compared to financial information. The amount of overall variance accounted for by contextual information in the judgments of the partners was 10% out of an overall 80%. A similar pattern is evidenced for the seniors; out of the overall variation of 72% accounted for, 9% is attributable to contextual

information.

A very different pattern of w^2 values is seen in Figure 1 for the students. Although cue #7 did receive the largest average w^2 value across the students (18%), this value is relatively similar to the w^2 values of cue #5 (12%) and cue #4 (11%), both contextual cues. In fact, of the 65% of the overall variation that can be accounted for by the main effects in the students' judgments, over one half of this overall variation (39%) can be accounted for by contextual information. This is a disproportionate amount relative to the results of the partners and seniors.

Inter-Auditor Agreement. The degree of consensus that exists among the materiality judgments of auditors can be examined at numerous levels. One such way is to examine the inter-auditor consensus of auditors with similar experience. Another is to examine the inter-auditor consensus between the materiality judgments of individuals within groups of varying experience. Finally, the judgmental strategy involved with making materiality judgments of individuals with similar and varying experience can yield information as to the degree of inter-auditor agreement. Each is considered in turn.

Correlation coefficients were also computed between the materiality judgments of each auditor-participant and every other auditor-participant. Thus, the degree of agreement between the partners and seniors, partners and

students, and seniors and students could be assessed. The average correlations for these groups of auditor-participants are as follows; partners and seniors $=.65$, partners and students $=.46$, and seniors and students $=.45$. Confidence intervals computed for each mean correlation revealed no differences between the partners' and students' correlations and the seniors' and students' correlations. However, the partners and seniors did have a greater degree of consistency relative to these other pairs of groups. That is, the degree of materiality as judged by the partners and seniors is significantly more consistent as compared to either the partners and students, or the seniors and students.

As reported earlier, there was almost identical use of information by the partners and seniors when determining materiality (see Figure 1). This consensus existed at the level of significant cue usage and the relevance of the cues; i.e., the effect on net income (cue #7) was significant across all partners and seniors and received unanimous overwhelming impact on the determination of materiality. The students, however, did not seem to show this same type of strategy; numerous students placed little impact on this piece of information, while others had no significant effect for cue #7 at all.

In summary, it appears that a great deal of agreement exists both within and between the judgments of the

partners and seniors with regard to the degree of materiality represented in the cases and the judgmental strategy involved in making such judgments. There appears to be less agreement both within the students judgments and between the students and the partners and seniors. In addition, it seems that although the partners and seniors do use contextual information when determining materiality, they place less relevance on this type of information as compared to the students.

DISCUSSION

Since the present research investigated issues relevant to two distinct disciplines, it will be useful to discuss separately the research implications for psychology and for auditing. In addition, the research limitations and avenues for future research are also discussed. This is followed by a more general discussion of some research issues.

The Psychological Issues

This research, among other things, assessed the relative contribution of academic training and practical working experience on the acquisition of expertise in auditing. This was achieved by examining the judgmental strategies and abilities of auditors with varying levels of experience. However, since the focus of this study is on the conditions leading to the acquisition of expertise, it first becomes necessary to examine and identify the judgmental strategies and abilities that characterize auditing expertise. Comparisons can then be made between auditors with lesser experience and students to determine which judgmental skills are acquired during academic training and which are gained through practical working experience.

The Expert Auditor. The research results suggest that expert auditors have at least two identifiable judgmental characteristics. First, the audit partners seem to possess the ability to distinguish between the relevance of various pieces of auditing information. When determining materiality in this task, all 10 audit partners focused primarily on one piece of information: the effect on net income. This is not meant to imply, however, that the other seven pieces of auditing information were not used by the audit partners for determining materiality. Most partners used other information in addition to the effect on net income when determining materiality; the average number of significant cues for the partners (3.3) attests to this. However, when making judgments of materiality, this "other" information was given much less relevance by the partners than the effect on net income. In short, this suggests that the effect on net income should have the most impact for determining materiality in the present task.

In addition, no significant differences were found between the amount of information used by the audit partners and the less experienced auditors. Taken together, these results present an interesting paradox. Recent research has suggested that experts may utilize many more pieces of information than was previously thought (see Phelps & Shanteau, 1978). Thus, should one be considered

expert if they focus primarily on one piece of information and appear to use no more information than non-experts?

However, the above question considers only the amount of information utilized while omitting an important dynamic component of expert judgment; namely the manner in which the experts determine the relevance or importance of the various pieces of information before they actually utilize it. Because numerous amounts of information are presented in a particular task, it should not necessarily imply that all the information is equally relevant to the problem at hand. Thus, while it may be the case that experts have the ability to utilize more information when forming judgments, the ability to first decide what is to be incorporated into a judgment is an equally important aspect that needs to be considered.

Given the relatively large omega square values for the effect on net income, it appears that the experts were able to focus on what they thought to be the most relevant aspect of the task. This also suggests that other information was deemed less relevant by the partners than the effect on net income. Thus, one of two things may have been occurring. When determining materiality, the partners may merely be focusing on the effect on net income and paying little if any attention to the other seven pieces of information. Another possibility is that each piece of information in this task was indeed evaluated by the

partners, but that net income was most important for determining materiality.

Given the amount of time taken to complete the auditing cases (as indicated by each participant on the post experiment questionnaire) this latter possibility appears more likely. The partners took considerably longer to complete the cases than the auditing students. In essence, this suggests that the partners were not merely focusing on the effect on net income while ignoring other information. If they were, completion of the task would have been relatively quick. The longer completion time for the partners implies that the partners evaluated each piece of information before deciding whether to include it in the judgment. In short, while one might be tempted to conclude from the results that a single-dimensional strategy was being employed by the partners, a more complex strategy involving the evaluation of all cues seems more likely.

A second distinguishing characteristic of expertise in auditing appears to be the ability to respond to the audit cases in a highly consistent fashion. As indicated by Einhorn (1974), the ability to be reliable in one's judgments is a necessary condition for the definition of expertise. The partners' judgments certainly meet such a criterion. Each of the 10 audit partners exhibited a high degree of within-case reliability across replications. Although this relatively high degree of consistency is

atypical for expert judgment research in general (e.g., Goldberg, 1970), these results are consistent with the degree of reliability typically found in judgment research in accounting (e.g., Ashton, 1974; Hamilton & Wright, 1980; Ashton & Kramer, 1980). Hence, these results suggest that the partners evaluated the information in a very consistent way across the auditing cases.

Thus, expert auditors in this task appear to be characterized by the ability to, 1) distinguish between the relevance of various pieces of auditing information and 2) to do so in a consistent fashion. That is, the partners seem to be able to "weed through" the information and focus on what is relevant to the task at hand. In addition, most partners seem to use a very consistent strategy when determining materiality in this task. Their strategy did not entail the direct use of all available information. Rather, the most influence revolves around the effect on net income; other auditing information caused only minor adjustments in the degree of materiality represented in each of the auditing cases.

However, little agreement exists among the partners as to what "other" information should be included in materiality judgments. After the effect on net income is considered, the number, type, and importance of the remaining information varies from partner to partner. Thus, the "standard" provided by the partners relative to

the determination of materiality would suggest "other" information could be included when making materiality judgments, so long as the effect on net income receives paramount importance.

Comparison of Experts and Non-Experts. It was originally hypothesized that the judgmental characteristics of the audit seniors would provide intermediary information about developmental trends between the students and the partners. Contrary to this prediction, however, the seniors did not provide a midpoint between these two groups. In fact, the seniors and the partners were almost indistinguishable with regard to the amount of information used, the type of information used, and the relevance attributed to each of the auditing cues. In addition, the degree of intra-auditor reliability, and inter-auditor consensus was not significantly different from those of the partners. In short, the judgmental strategies used by the seniors were quite similar to those of the partners.

The above discussion suggests that any differences that may exist between the partners and seniors do not revolve around the judgmental issues investigated in the present research. At every level, the audit seniors clearly reflect the "standard" provided by the audit partners.

The hypothesis that there would be noticeable

differences in the manner that the experts and the students made materiality judgments was supported by some results but not others. Relative to the amount of information used, the results indicated that when compared to the partners, the students incorporated no less information when determining materiality. Thus, for this particular task it appears that any differences between the partners and the students do not revolve around the amount of information used in forming judgments.

With regard to the relevance attributed to each of the auditing cues, the students differ considerably from the "standard" provided by the audit partners. The students did not focus on the effect on net income when determining materiality, and instead attached considerable impact to information which received relatively little attention by the partners. The students were knowledgeable of the message conveyed by the cues; direct feedback on their post-experiment-questionnaires indicated no cue was beyond their level of comprehension. However, they were unable to properly (as defined by the audit partners) assess the relevance/impact of some cues for purposes of determining materiality. In short, it would appear that academic training provides the technical background to understand the message content of a cue, but not necessarily the ability to evaluate its relevance.

One possible explanation for this discrepancy is an

inability on the part of the students to disregard information which is well-understood but of little relevance to the task at hand. The students, once understanding what is meant by a particular cue, appear to lack the ability to minimize its impact. This problem however, is not unique to auditing.

A parallel is seen to the weight and scale value problem evidenced in much of the psychological judgment literature (Gaeth, 1980; Phelps, 1977). The students here appear to comprehend the scale value of each cue, but are unable to properly assess its weight. As discussed earlier, the partners appear to possess the ability to disregard or deemphasize information. Thus, they seem to properly incorporate both scale value and the weights of the cues when determining materiality.

The students also differ from the partners in regard to intra-auditor consistency (i.e., reliability). The students were less able to respond consistently to identical auditing cases than the partners. To some degree, this may reflect the students inability to focus on the cue(s) important for purposes of determining materiality. Thus, in contrast to the audit partners, the students were unable to apply a consistent judgmental strategy throughout the auditing cases.

In regard to inter-auditor correlations, the students have less inter-auditor agreement (i.e., consensus) as

compared to the partners. This should not be too surprising given the particular manner participants from each group formed their materiality judgments. Each audit partner appeared to make his/her materiality judgments in a very similar fashion (focus on the effect on net income), whereas each student seemed to have his/her own unique strategy for determining materiality. Thus, the significantly lower inter-auditor correlations for the students reflects not only a lack of consensus, but also appears to suggest a ideosyncratic use of information.

Given the numerous judgmental similarities between the partners and the seniors, it is not surprising to find that the same differences between the partners and the students (discussed above) were also found for the seniors and the students. The seniors are more reliable than the students, have a greater degree of inter-auditor consensus, and focus their judgments to a greater extent on the effect on net income.

The Auditing Issues

The Role of Contextual Information. The research design included contextual information to add a degree of realism to the experimental task and to test the hypothesis that this information would be incorporated into the materiality judgments of auditors regardless of level of experience. The results clearly suggest such information

was considered when making these judgments. Three fourths of the auditor participants used at least one contextual cue when determining materiality. Although the specific amount of contextual information used by the auditor-participants varied as a function of the individual, some interesting group trends were noticed.

The students considered contextual information to be of more importance for judging materiality than either the partners or the seniors. The students large reliance on contextual information makes sense given their auditing background. All five contextual cues represent topics the students are heavily exposed to during their academic training. This is especially true for the topics of accounting policies (cue #4) and internal control (cue #5) which received emphasis importance by the students. Related to previous discussion, it appears the students lack the ability to justify why concepts heavily stressed in their training should not be included in their judgments.

The partners and the seniors, on the other hand, did not totally disregard contextual information when determining materiality. Rather, they downplayed its relevance. For the particular task presented here, the partners and the seniors concur that contextual information should be considered when forming judgments of materiality. However, these contextual cues had much less impact

relative to the overwhelming effect of the effect on net income. Almost invariably, the partners and seniors utilized a strategy where the contextual information had only a small effect on the overall determination of materiality. The total variance accounted for by the five contextual variables for these two groups was 10% and 9% respectively.

It can be concluded that both professional auditors and students used contextual information when forming materiality judgments. However, a different emphasis was placed on this information by each of these groups; i.e., the professionals used this information to a lesser degree than did the students. In any case, the results indicate that regardless of experience the presence of contextual information can have important affects on materiality judgments.

Inter-Auditor Consensus. It is not unusual to find high degrees of judgmental consensus among professional auditors and auditing students (e.g., Ashton & Kramer, 1980; Hamilton & Wright, 1980; Ashton, 1974). One explanation for this overall agreement between auditors is Ashton's (1974) notion that the training and study of many auditing issues is not likely to differ substantially among reputable universities. This explanation would appear to account for the high levels of agreement found in previous studies; all professional auditors have university training

and the students used are typically from the same university if not the same class.

Ashton's explanation, however, fails to account for the results obtained in this study. The students (who were from the same auditing class with the same instructor) had lower inter-auditor agreement than did the partners or seniors, of which few if any attended the same university. If uniformity in the academic training of auditors is to account for the high degrees of consensus, the auditing students should be in more agreement than the partners or seniors.

How then might the results of the present investigation be explained? Why would the professional auditors, whose academic training differed to some degree, be in more agreement than students from the same auditing class? One possible explanation may come from the professional auditors' ability to disregard irrelevant information and focus on the relevant aspect(s) of the task at hand. Consequently, their inter-judge consensus was high. The students were apparently unable to focus on similar auditing information and consequently employed varying strategies to judge materiality.

Thus, it would appear that Ashton's (1974) explanation tells only a small part of the entire story. Similarities in academic training can certainly account for some degree of the inter-auditor consensus exhibited by

both the students and the professionals. However, the ability to know what information to focus on and what to disregard, may better account for the high degrees of consensus found for the professional auditors.

Students as Surrogates. Another issue of considerable importance is that of using students as surrogates for experts in accounting research. Much behavioral research in accounting has employed auditing students with the intent of generalizing to the professional auditor (Ashton & Kramer, 1980). However, little research has examined the validity of using students as surrogates for professional auditors.

Recently, Hamilton and Wright (1980) specifically investigated this issue with regard to internal control judgments (see Ashton, 1973). Their results revealed considerable similarity between professional auditors and auditing students with regard to inter-auditor consensus and their use of information. Ashton and Kramer (1980) also found similarities in the judgmental consensus and cue utilization of professionals and students when making internal control judgments. These researchers conclude that for empirical research in accounting "...the students are adequate surrogates for the auditors" (Ashton & Kramer, 1980, pp. 16).

The results of this investigation, however, clearly suggest otherwise. With regard to every judgmental issue

examined here (excluding the amount of information used), the students differed significantly from the professional auditors. The students' degree of inter-auditor consensus and intra-auditor reliability was lower than that of the professionals. Similarly, there were notable differences in the type of the auditing information used by these two groups. These results suggest that the students would not be good surrogates for the professionals.

What might account for the conflicting results found in the present investigation? One possibility is the nature of the experimental tasks used in these studies.

Participants in Ashton and Kramer (1980) and Hamilton and Wright (1980) judged the strength of internal control on the basis of yes-no indicators; this is a straightforward, well-defined procedure found in most auditing textbooks. The professional auditors would most likely find these tasks simplistic and might be hard-pressed to display any special skills or abilities. Likewise, the students would find no special problems in completing this task. Thus, it should not be surprising to find similarities between professionals and students on a task that could hardly be considered demanding by either group. In examining the issue of student surrogation, it would seem desirable to utilize an experimental task sophisticated enough to challenge professionals, yet also be understood by students. Such a task was employed in the present

investigation.

Participants in the present study had to assess and combine eight pieces of diverse information into an overall judgment of materiality. No set rules or procedures exist for using this information to determine materiality. The auditor must rely solely on his/her professional judgment. This notion of professional judgment has long been thought to be a critical component of auditing expertise (Krogstad, 1980). Not surprisingly, this task revealed notable differences between the professionals and the students.

Thus, previous work with regard to student surrogates (i.e., Ashton & Kramer, 1980; Hamilton & Wright, 1980) might best be viewed as representing tasks which failed to reveal differences between professional auditors and auditing students. However, these studies should not suggest that for all auditing judgments (especially the more complex ones such as materiality), students are good surrogates for professionals. It is likely that differences would have been found had previous research used an experimental task that was more complex and challenging.

In short, the results of this investigation suggest that the use of students as surrogates in accounting research (using sophisticated judgmental tasks) might result in faulty conclusions. That is, the students' strategies may reveal little about the strategies of the

experts.

The Concept of Materiality. The goals of the present research were approached by examining the materiality judgments of different groups of auditor-participants. As such, the results obtained can be used as a vehicle with which to attempt an understanding of how, in this particular task, the concept of materiality is operationalized by each group.

The results indicate that materiality was used somewhat differently by the students as compared to either the partners or the seniors. The partners and the seniors focused primarily on the effect on net income when determining materiality (with other information considered less relevant). The students on the other hand, spread their focus over more of the cues when making these judgments. The judgments of the partner/expert may thus suggest the following rule: when deciding whether the proposed adjustment is material or immaterial, the effect on net income should have the most impact.

Examination of the raw scores of the partners further indicates how instrumental the effect on net income was to the determination of materiality. Given the response measure utilized in this research (a 100mm line scored 0-100 with a marked midpoint), a mark to the left of the midpoint (scored 0-49) indicates an item judged as

immaterial, whereas a mark to the right of the midpoint (scored 51-100) indicates an item judged judged as material.

Separating the partners judgments in this dichotomous fashion (i.e., material or immaterial), indicates an interesting pattern of responding with respect to the effect on net income. For the partners, the determination of an item as material or immaterial appeared to vary as a function of the particular level presented of the effect on net income; i.e., if the presented level of the effect on net income was high (a 2.7% reduction in net income) the item was deemed immaterial 66% of the time; if the presented level of cue #7 was low (a 7.3% reduction in net income) the item was deemed material 82% of the time. This was the case regardless of the levels of the other 7 auditing cues presented with each case.

This relationship is illustrated in Figure 2. As can be seen, the same pattern of responding relative to the effect on net income (cue #7) was evidenced for the seniors. The students, however, did not vary their judgments as much as a function of the level of cue #7. In fact, additional analysis of the students judgments indicated that no one cue had a dominant effect on determining whether a judgment was material or immaterial. The students did not focus on any particular cue when determining materiality.

The above results might suggest that the partners were adopting a 2-stage strategy for determining materiality. This involved, first, making an initial judgment based on the level of the effect on net income, and then, adjusting this judgment using other information. That is, a preliminary decision of materiality/immateriality is first made, with other relevant information causing minor adjustments in the initial judgment. Judgments made in this fashion would be similar to the anchoring-and-adjustment strategies discussed in both the psychological and accounting literature (e.g., Tversky & Kahneman, 1974; Libby & Lewis, 1977).

Although this interpretation seems to account for the data, it must be noted that the present research is not capable of determining the precise judgmental strategies used by the participants (see the limitations section below). Thus, any definitive statements with regard to the use of a specific strategy, will have to await future investigations.

Research Limitations

Several qualifications might be noted with regard to the present research. First, it should be pointed out that the present research examined judgments in a simulated as opposed to real-world situation. When conducting empirical research in such settings it is crucial, for reasons of

generalization, to have the experimental task simulate the real-world as closely as possible (Ebbeson & Konenci, 1980).

Although the present task was quite realistic, it was unable to fully capture the auditor's everyday approach to conducting an audit. Typically, any audit involves the gathering and evaluation of information in a dynamic, sequential fashion. That is, the examination of information already collected determines the depth and extent of subsequent audit procedures.

The simulated task employed here was considerably more static in nature. The information to be evaluated and combined was presented simultaneously as opposed to sequentially. Thus, the results obtained here cannot necessarily be generalized to how auditors make judgments in the real-world. This is not meant to suggest, however, that for the participants the task lacked any validity. In fact, many of the participants commented favorably on the realistic nature of the task. In addition, the consistent differences revealed between the judgmental strategies of the professionals and the students suggests that the participants were able to respond meaningfully on the task.

A second limitation exists with regard to the specific focus of the present investigation; i.e., the examination of judgmental skills used in determining materiality. Most expert judgment research in psychology, as well as

accounting, have taken the approach of focusing on the experts' use of information, consistency, and consensus (e.g., Phelps & Shanteau, 1977; Slovic, 1969; Einhorn, 1974; Hamilton & Wright, 1980).

While the present research (as well as the others) has contributed to the understanding of some conditions of expertise, the possibility exists that expertise constitutes a number of other factors not considered here. . These might include confidence in one's judgment, general ability to identify problems, ability to present logical arguments, and ability to adapt to new situations, among others. In other words, the present research puts an emphasis on factors which may only partially contribute to expertise. The lack of notable judgmental differences between the seniors (experienced non-experts) and the partners (experienced experts) lends some credibility to this notion that factors other than judgmental skills contribute to auditing expertise.

Third, although the present research is unique in revealing consistent differences between professionals and students (the student surrogation issue), it is unable to interpret the exact nature of these differences. That is, what is the role practical experience plays in the development of expertise? Several explanations exist for the results. For instance, one explanation is that the experts may be more consistent in applying old judgmental

rules when determining materiality. A second explanation is that with experience the experts may learn new judgmental rules and consistently apply these to determine materiality. A third explanation is that the experts possess a better ability to correctly identify the problem (i.e., superior pre-decision analysis). This research is unable to distinguish between the validity of these potential explanations. Had this researcher been able to periodically examine professional auditors over a specified amount of time (i.e., a number of years), the specific contribution of practical experience would be less tenuous.

A fourth limitation exists with regard to the specific judgment/decision task examined here: the materiality of a proposed adjustment. It might be argued that this is a task of limited generality. However, this is a reasonable judgment for both professionals and students to make. Moreover, the materiality concept is ubiquitous in accounting. Consequently, the concept can be applied to numerous other types of auditing situations (e.g., internal control, accounts receivable, inventory). Thus, an interesting question concerns whether for these other situations the auditor determines materiality using similar judgmental strategies? That is, do the results obtained here (e.g., concentration on the effect on net income) generalize to other situations where materiality judgments are made? While it might be assumed that the materiality

concept is general enough to have some commonalities across different situations, definitive statements as to any common threads must necessarily wait for future research.

Finally, it should be noted that all the students used here were obtained from the same source - an auditing class at Kansas State University. Similarly, the auditors were all drawn from the Omaha offices of Big-Eight Accounting firms. The extent to which these groups represent auditing students and professional auditors in general is not known. However, there is no good reason to believe that auditing students at Kansas State University are notably different from auditing students in general (see Footnote 1.). Likewise, since the Big-Eight Accounting firms have many standard procedures which are invariant from city to city, it is assumed that auditors from Omaha are not significantly different than auditors in other parts of the country.

Future Research

Given some of the new issues raised by the present investigation and the limitations discussed above, numerous suggestions can be made for subsequent research. One interesting issue to examine in future research would be the "information-search" strategies of auditors with varying levels of experience. Besides the fact that this author is not aware of any research which investigates this

issue, such research could make for numerous contributions.

First, the utilization of an information-search procedure would allow for the examination of judgmental skills (e.g., use of information, consistency, etc.) on a task which may simulate more closely the actual audit environment. That is, the auditor might make sequential requests for information, for example, on a computer terminal with data banks. On the basis of information obtained, the auditor would then make some decision/judgment (e.g., materiality), or request additional information.

Secondly, this research might shed some light on the nature of the differences found here between professionals and students. That is, the particular strategies employed to determine judgments such as materiality might become more clear if the manner in which such judgments are made is examined in a dynamic fashion. Likewise, such research might also indicate the degree to which the experts agree in process, as well as outcome. That is, auditors may arrive at similar judgments in very different ways. In addition, such research would be able to more closely investigate the anchoring-and-adjustment issue raised above.

Another avenue of subsequent research with experts might examine some of the non-judgmental issues discussed above (see Limitations). Such research might determine the

extent to which expertise is trainable. Apparently, by focusing primarily on judgmental skills, the present research and previous work with experts, has implied, that expertise is indeed trainable. In fact, some of the early work with experts (Goldberg, 1968) explicitly stated this as their primary goal. However, if experts are found to possess certain qualities not related to judgmental skills (e.g., confidence or adaptability), then the goals of much expert judgment research may need to be modified. Training one to focus on certain information or to be more consistent when making judgments may be a feasible task. However, training one to be more confident in his/her judgment may not be as feasible. That is, some non-judgmental skills possessed by experts may represent aspects that an individual either has or does not have.

Finally, if the development of expertise is of interest, one should make attempts to conduct future research in a longitudinal fashion. Although the present research has contributed somewhat to our understanding of the differences in the skills possessed by students and professionals, it was unable to pinpoint the specific nature of these differences. That is, comparisons between groups with different experience indicates little about the effects of experience within individuals.

Such research, for example, might follow the auditing student during his/her last two years of college and first

three years on the job. This would allow more definitive statements as to the development of skills towards expertise. That is, specific changes one makes as they climb the professional ladder could be examined more closely.

CONCLUSIONS AND IMPLICATIONS

From this research, the following can be concluded: 1) professional auditors appear to be competent in making materiality judgments; 2) academic training may be inadequate to train auditing expertise; 3) contextual information does have an effect on the materiality judgments of both students and professionals; and 4) auditing may provide a useful area for psychological research in general. The implications of these conclusions are considered below.

Professional Competence

This research indicates that the audit partners (and audit seniors) focus on the relevant aspect(s) of the task, and in doing so exhibit high degrees of consistency and consensus. That is, the professional auditors possess the ability to discriminate between the important and not-so-important aspects of the task, and to do so in a consistent fashion.

The relative proficiency of these professionals appears contrary to previous research which has tended to view humans as limited in their cognitive abilities (e.g., Goldberg, 1970; Dawes & Corrigan, 1974). It should be pointed out however, that the primary intent of these earlier researchers seems to have been identifying the

cognitive limitations of decision makers. Not surprisingly, these researchers and others have found numerous deficiencies in human judgment; e.g., the inability to know our weighting of information in a judgment task (e.g., Slovic, 1969), shortcomings in calibration (Lichtenstein & Fischhoff, 1980), or using less than optimal decision rules (Slovic & Lichtenstein, 1971). In short, the emphasis on human deficiencies has provided a focal point for much research not only in cognitive psychology (e.g., Dawes, 1971; Goldberg, 1968; Tversky & Kahneman, 1974; Sampson, 1981), but in psychology in general (Samelson, 1981).

The approach taken in this research, however, was somewhat different. This investigation focused on the judgmental skills that characterize auditing expertise. From this perspective, it was found that expert auditors do possess some special skills, and more importantly, these experts appear to be competent in making materiality judgments. Deficiencies in the partners' judgments could have been emphasized here; i.e., their judgments do, in fact, leave room for improvement. However, emphasizing the cognitive abilities of acknowledged experts in auditing can make for numerous contributions ranging from the identification of skills for defining auditing expertise (e.g., Einhorn, 1974), to the development of a program to improve auditing decisions (for a similar application in

agronomy see Gaeth, 1980)

Academic Training and the Acquisition of Expertise

This research indicates that academic training and practical working experience contribute different general skills to the development of auditing expertise. More importantly, auditing expertise seems to represent more than is acquired through academic training.

The results indicate that academic training apparently does provide students with the technical background to understand auditing information and the ability to understand judgments of materiality. However, the students attribute too much relevance to certain information (e.g., the quality of internal control and type of accounting policies), and appear unable to focus on the relevant aspect(s) of the task; i.e., the effect on net income. The consequences of this are judgments inferior to the audit partners.

Practical experience, on the other hand, seems to augment the skills acquired through academic training. The partners were able to focus on the important information and exhibited high degrees of consistency and consensus. Experience also appears to provide the confidence and/or know-how to attribute little or no relevance to technical information in a particular case (see limitations section above). Of course technical knowledge (which is typically acquired through academic training) will be necessary for

one to focus on the relevant aspect(s) of the task, but technical competence alone does not appear to be a sufficient condition for expertise.

An analogy might be seen in the individual who learns to dribble a basketball behind his/her back. This knowledge/skill constitutes a special ability not unlike technical competence in auditing. However, such abilities only become useful when one knows when to use it, and perhaps more importantly, when not to use it.

Indiscriminately dribbling behind ones back would be analogous to the auditing student who desires to include all which is understood in a judgment, regardless of its utility or relevance. In both situations the mark of the expert would be the ability to incorporate available knowledge or skills at the appropriate time.

If academic training is to prepare one for the working world, it would seem desirable for the students to use the information in a fashion similar to the experts. The judgment strategies of the students and the professional auditors seems to indicate that practical experience provides the professionals with additional judgmental skills beyond those acquired through academic training (at least as provided by Kansas State University). Thus, the interesting question becomes, can the experimental factor of expertise be trained? If so, what particular approach might better train the students to

emulate the judgmental strategies of the partners?

Since the students attributed too much importance to some not-so-relevant information, a practical first step toward addressing this question would be to stress during training the identification and separation of the important factors for a particular task. At the same time it should also be stressed that for any decision there will always be a wide range of information that varies as to its relevance. That is, a multitude of information will exist that should not be heavily considered. Taken together, these may sensitize the students to the fact that there are advantages to ignoring information; e.g., allowing one to better focus on important information. Similar training approaches have been successfully used with students in agronomy (Gaeth, 1980) and nursing (Shanteau, Grier, Johnson, & Berner; 1981).

In short, these suggestions may provide the auditing students with a useful mental framework for better emulating professional judgments. That is, by realizing the utility of both ignoring and including certain information, these students may improve their judgment strategies.

Given that the gathering of information during the actual audit always has economic considerations in terms of cost, the above suggestions with regard to the training of students could have numerous positive consequences for the

auditing profession. Typically, more evidence is gathered during an audit for items deemed more important to the task at hand. Hence, the gathering of too much information on relatively unimportant items (as the students might do when they initially enter an accounting firm) could cause unnecessary increases in the cost of the audit. More importantly, this reliance on not-so-relevant information may result in faulty judgments which could have damaging long-term effects for an accounting firm (e.g., lawsuits and/or a loss of credibility). Thus, emphasizing the efficient use of relevant information may be one worthwhile goal for academic training to pursue.

The Role of Contextual Information

The results of this research also indicate that contextual information can have effects on materiality judgments. A majority of the auditor/participants incorporated contextual information into their materiality judgements.

Although previous materiality research (e.g., Moriarity & Barron, 1976) has speculated on the potential importance of contextual information, the present research provides empirical support for this notion. Reliance on this type of information appears to decrease as one moves from the role of the student to the role of the professional. It seems as if the students anticipate contextual information to be of greater importance (when

they enter the working world) than it actually is. The professional auditor, on the other hand, is able to focus on the relevant aspect(s) of the task (i.e., the effect on net income) and thus contextual cues have less of an impact.

The effect of context, although novel in the auditing literature, has been of interest to psychologists for over half a century (e.g., Titchner, 1909). Much research has indicated that contextual information does have an influence on human judgment (Helson, 1951; Asch, 1952; Brunswick, 1956; Palmer, 1975). These results, and those of the present investigation, thus suggest that any future research dealing with materiality judgments should seriously consider the role of contextual information on auditors judgments.

Auditing as a Research Area

When conducting behavioral research, it is necessary to trade-off experimental control in the research design against conditions that reflect some real world settings. Unfortunately, one of these is typically achieved at the expense of the other. However, auditing may provide psychological researchers with the opportunity to effectively balance these two and as such may be a potentially useful area for research.

Although the particular stimuli employed were controlled by the experimenter, the present task provides a

good example where artificiality is not automatically implied because of experimental control (also see Phelps & Shanteau, 1977). The present research utilized experimental stimuli similar to what professional auditors encounter in their everyday activities. For instance, it is not uncommon for an auditor during an audit engagement to make judgments of materiality after reviewing numerous pieces of information. In addition, many times the information presented to the auditor in the "real world" is in a summary form (e.g., a reduction in net income by 2.7%). Thus, the experimental stimuli was probably familiar and not particularly unusual.

In addition, the accounting profession in general seems very supportive of empirical research. The cooperation this researcher received from the accounting firms was commendable. The participants were also highly motivated and most eager to make a contribution to their profession.

The area of auditing may thus be a fruitful one for psychological research, especially work in the area of human judgment. Given the recent concern for more realistic types of research endeavors (e.g., Cronbach, 1975, Hammond, 1979), one would do well to conduct empirical investigations in an area such as auditing, where the degree of professional cooperation is high, and experimentally controlled situations can be presented in a

naturalistic fashion.

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FOOTNOTES

- 1) Three points of interest should be noted with regard to the student group. First, Kansas State University is considered to be a reputable business school, and is accredited by the American Assembly of Collegiate Schools of Business. Second, all students were recruited from the same auditing class taught by the same instructor. Third, these students were among the best accounting majors at Kansas State, and at the time of their participation, most had secured employment in Big-Eight accounting firms.
- 2) The 11 seniors used in this research all specialized in auditing commercial corporations (as opposed to transportation, not-for-profit, utilities, etc.). This was to ensure that the experimental task would not be unfamiliar or extraordinary.
- 3) Partners are said to be "expert" for various reasons. They have the highest authority within an accounting firm; very rarely if ever is an audit engagement finalized or an opinion issued without their approval. Each partner is thoroughly screened before being admitted to partnership. This screening usually consists of careful evaluation of each audit the potential partner was engaged on, in addition to evaluation by his/her peers as to their degree of

professional judgment. It should also be noted that the actions/judgments of the audit partner make the entire accounting firm liable for a particular engagement.

- 4) It should be noted that the experimenter made every attempt to make the procedures for the professionals and the students as similar as possible.
- 5) Although this information may not reflect present-day (1980) conditions, it was provided to ensure a 'cognitive set' which constitutes normal economic conditions. It seems unlikely this information would have effected the results in any significant fashion.
- 6) There are generally two types of materiality judgments auditors will make, scope and disclosure. Requiring participants to issue audit opinions for each case reminded them of the disclosure emphasis of the task, and ensures that the materiality judgments obtained are all of the same nature.
- 7) The specific fractional design used allows estimation of five out of a possible 55 2-way interactions.
- 8) In fact some audit partners commented favorably on the post-experiment-questionnaire that their strategy for making materiality judgments entailed focusing on cue #7 first, and then making adjustments relative to other information.

Table 1

Partners' F Values for Each Cue and Interaction

Cue #	Partner #										Total
	6	9	10	13	16	17	18	20	21	22	
1	<1	1.25	<1	4.91	<1	<1	11.35*	1.99	<1	2.72	1
2	14.73*	<1	1.06	<1	<1	1.93	<1	7.08*	5.19*	14.43*	4
3	<1	<1	1.93	11.84*	<1	<1	14.52*	1.99	<1	4.45*	3
4	<1	3.84	3.02	11.2 *	<1	<1	4.94*	14.48*	2.59	14.73*	4
5	<1	2.47	<1	2.72	<1	2.91	9.64*	5.36*	<1	19.82*	3
6	3.54	1.81	<1	9.39*	2.02	1.6	1.69	<1	1.63	<1	1
7	82.31*	348.7 *	220.41*	201.33*	30.66*	209.36*	237.09*	23.99*	25.23*	104.98*	10
8	62.19*	4.30*	15.93*	19.22*	4.03	<1	2.72	5.48*	12.80*	<1	6
1 x 7	1.40	<1	<1	<1	<1	<1	5.98*	<1	<1	<1	1
3 x 7	<1	1.81	<1	<1	<1	1.28	<1	1.25	1.04	<1	0
4 x 7	<1	1.81	<1	<1	<1	1.91	<1	<1	<1	1.07	0
5 x 7	<1	<1	1.26	2.73	<1	1.15	<1	<1	<1	<1	0
7 x 8	10.31*	<1	<1	1.39	1.95	<1	3.51	1.56	<1	<1	1

Main

Effects 3

Inter-

actions 1

*p < .05

Table 2
Percentage of Variance Accounted for (w^2)
by Each Cue for Each Partner

Cue #	Partner #											Avg.
	6	9	10	13	16	17	18	20	21	22		
1	.00	.00	.00	.01	.00	.00	.03	.01	.00	.01		.01
2	.07	.00	.00	.00	.00	.01	.00	.07	.06	.07		.03
3	.00	.00	.00	.04	.00	.00	.04	.01	.00	.02		.01
4	.00	.01	.01	.03	.00	.00	.01	.17	.02	.08		.03
5	.00	.00	.00	.01	.00	.01	.02	.05	.00	.10		.02
6	.01	.00	.00	.03	.02	.00	.00	.00	.01	.00		.01
7	.42	.90	.82	.70	.50	.86	.76	.28	.36	.57		.62
8	.31	.01	.05	.06	.05	.00	.01	.06	.18	.00		.07
Total	.81	.92	.88	.88	.57	.88	.87	.65	.63	.85		.80

Table 3

Seniors' F Values for Each Cue and Interaction

Cue #	Senior #										Total
	1	2	3	4	5	8	12	14	15	23	24
1	5.67*	5.87*	<1	<1	6.00*	7.54*	<1	10.75*	<1	3.41	3.48
2	<1	<1	4.43	<1	4.30	4.51*	<1	<1	<1	1.42	9.57*
3	<1	<1	<1	<1	3.19	<1	<1	1.19	3.37	6.33	10.46*
4	5.48*	1.55	1.30	1.33	<1	3.48	<1	1.53	1.11	44.14*	5.49*
5	3.91	1.09	18.68*	<1	<1	<1	<1	<1	<1	2.83	<1
6	4.41	2.42	1.20	1.39	3.34	1.54	<1	<1	3.67	3.94	21.72*
7	25.46*	41.9*	53.31*	27.98*	236.03*	56.44*	18.62*	32.81*	265.88*	136.41*	553.29*
8	10.17*	<1	<1	17.66*	30.04*	6.70*	<1	<1	9.54	<1	11.79*
1 x 7	<1	<1	<1	<1	<1	<1	<1	7.11*	<1	1.08	4.59*
3 x 7	<1	<1	<1	<1	3.97	<1	<1	<1	<1	3.37	10.46*
4 x 7	<1	<1	2.97	<1	1.54	<1	<1	<1	<1	4.90*	4.89*
5 x 7	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
7 x 8	<1	<1	<1	<1	4.48	<1	<1	2.34	<1	2.71	11.79*

Main

Effects

Inter-

actions

*p < .05

Table 4
Percentage of Variance Accounted for (w^2)
by Each Cue for Each Senior

Cue #	Senior #								Avg.
	1	2	3	4	5	8	12	14	
1	.06	.07	.00	.00	.02	.07	.00	.13	.00
2	.00	.00	.03	.00	.01	.04	.00	.00	.01
3	.00	.00	.00	.00	.01	.00	.00	.00	.01
4	.06	.01	.00	.00	.00	.02	.00	.01	.03
5	.04	.00	.16	.00	.00	.00	.00	.00	.02
6	.04	.02	.00	.01	.01	.01	.00	.00	.01
7	.32	.55	.48	.40	.72	.56	.45	.43	.56
8	.12	.00	.00	.25	.09	.06	.00	.00	.05
Total	.64	.65	.67	.66	.86	.76	.45	.57	.71

Table 5

Students' F Values for Each Cue and Interaction

Cue #	1	2	3	4	5	6	7	8	9	10	11	Total
1	<1	<1	1.83	1.13	<1	2.03	<1	1.36	<1	9.26*	<1	1
2	<1	2.16	<1	<1	<1	38.32*	<1	<1	1.06	3.17	<1	2
3	<1	<1	5.39*	<1	<1	5.35*	<1	2.64	6.37	3.17	33.95*	3
4	<1	11.32*	20.02*	4.37	3.82	<1	6.63*	7.68*	21.08*	23.30*	<1	6
5	3.98	34.76*	2.95	4.64*	14.62*	6.38*	24.57*	<1	4.20	<1	19.08*	6
6	2.11	<1	2.25	<1	10.25*	<1	1.15	<1	<1	2.14	2.84	1
7	75.85*	<1	5.50*	11.84*	26.06*	8.41*	32.92*	<1	8.00*	43.70*	2.01	8
8	75.85*	1.53	<1	<1	1.24	34.88*	<1	<1	1.21	<1	<1	2
1 x 7	<1	<1	<1	<1	<1	<1	<1	6.47	3.53	5.07*	<1	1
3 x 7	<1	<1	<1	<1	<1	4.11	<1	<1	<1	2.64	1.29	0
4 x 7	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	0
5 x 7	1.84	9.29*	<1	1.92	2.89	5.02*	<1	<1	<1	<1	<1	2
7 x 8	5.99*	<1	7.47*	<1	<1	<1	2.34	3.44	<1	<1	<1	2

Main

Effects 2

Inter-

actions 1

*p < .05

Table 6
Percentage of Variance Accounted for (W^2)
by Each Cue for Each Student

Cue #	Student #										
	1	2	3	4	5	6	7	8	9	10	11
1	.00	.00	.01	.00	.00	.01	.00	.01	.00	.07	.00
2	.00	.01	.00	.00	.00	.29	.00	.00	.00	.02	.00
3	.00	.00	.07	.00	.00	.03	.00	.04	.08	.02	.39
4	.00	.13	.29	.07	.03	.00	.07	.16	.30	.20	.00
5	.02	.43	.03	.08	.17	.04	.27	.00	.05	.00	.21
6	.01	.00	.02	.00	.11	.00	.00	.00	.00	.01	.02
7	.41	.00	.07	.24	.31	.06	.37	.00	.11	.37	.01
8	.41	.01	.00	.00	.00	.26	.00	.00	.00	.00	.00
Total	.85	.58	.49	.39	.52	.69	.82	.21	.54	.69	.63
											.59

Figure Caption

Figure 1. Percentage of variance accounted for (w^2)
by each cue across groups.

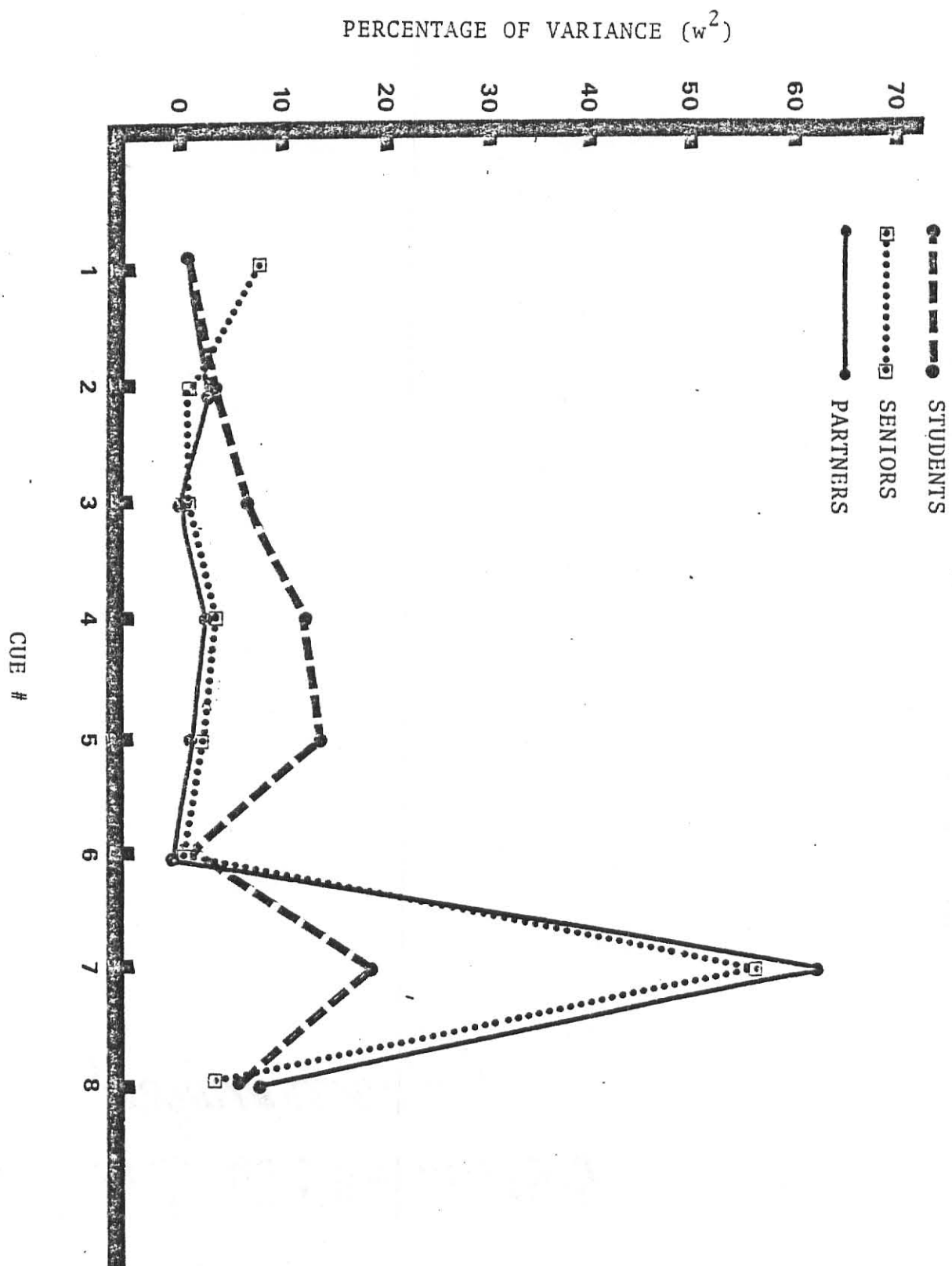
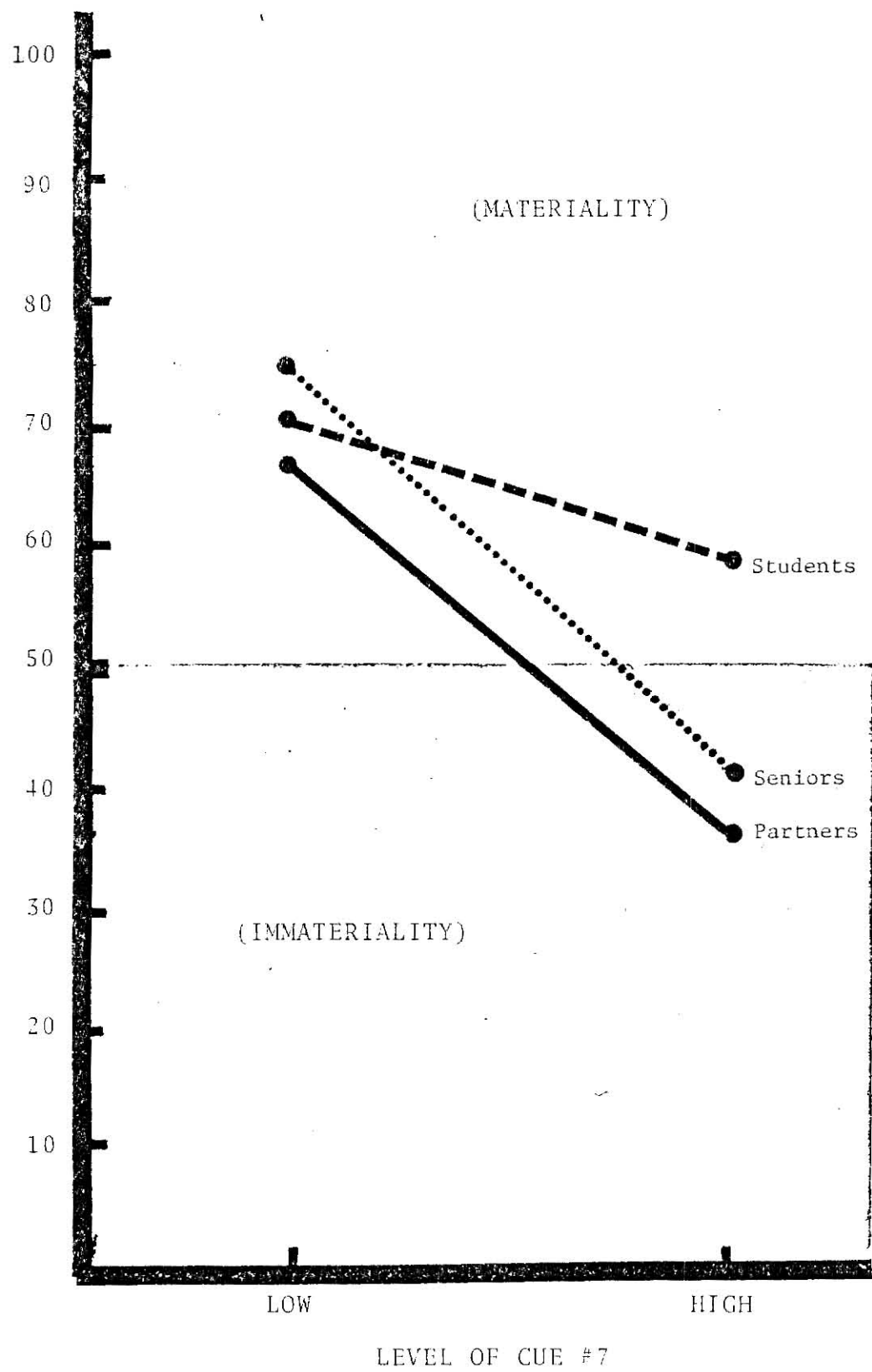


Figure Caption

Figure 2. Average materiality judgments across groups as a function of level of cue #7.



APPENDIX A

INSTRUCTIONS AND PRACTICE CASE

INSTRUCTIONS.

Consider the following hypothetical situation: you are the auditor in charge of hypothetical audit engagements that follow. Being the auditor in charge it becomes necessary for you to make informed professional judgments as to the 'immateriality' or 'materiality' of various items. Although it is certainly the case that various items are deemed as either, 'immaterial' or 'material', you may agree that of two items that are both deemed as 'material', one of the items may represent a differing degree of 'materiality' than the other. The same may be said for two items both deemed as 'immaterial'; one of the items may represent a differing degree of 'immateriality' as compared to the other. Thus, one may conclude that despite items being determined as 'immaterial' or 'material', there are differing degrees of 'materiality' and 'immateriality'.

In this study I will be asking you to make a judgment of 'materiality' or 'immateriality' by placing a mark somewhere along a line labelled "CLEARLY IMMATERIAL" at the left end, and "CLEARLY MATERIAL" at the right end, as shown below:

CLEARLY IMMATERIAL |-----| CLEARLY MATERIAL

The line in the middle divides the line in half.

If you feel the item in question is 'immaterial' you should make your mark closer to the CLEARLY IMMATERIAL end. If you feel the item in question is 'material', you should make your mark closer to the CLEARLY MATERIAL end. The more strongly you feel about a particular item's 'immateriality' or 'materiality', the closer to that end of the line should be your mark.

To familiarize you with this method of making these types of judgments, there are four practice situations on the following page:

Make an appropriate mark along the line which you feel corresponds to the statement above the line.

1. If you feel that the item in question is very 'immaterial', you would mark the line where?

CLEARLY IMMATERIAL |-----| CLEARLY MATERIAL

2. If you feel the item in question is somewhat 'immaterial', you would mark the line where?

CLEARLY IMMATERIAL |-----| CLEARLY MATERIAL

3. If you feel that the item in question is very 'material', you would mark the line where?

CLEARLY IMMATERIAL |-----| CLEARLY MATERIAL

4. If you feel the item in question is somewhat 'material', you would mark the line where?

CLEARLY IMMATERIAL |-----| CLEARLY MATERIAL

What is now being asked of you is to make your judgment about 'materiality/immateriality' given the following circumstances:

You are to place yourself in the position of the auditor in charge of the hypothetical audit engagements that follow. Normal audit procedures lead you to believe that the year-end "Allowance for Doubtful Accounts" should be increased.

Examine carefully the data presented for each of the following four practice cases, and respond thoughtfully to the two questions listed below the data. Each case should be analyzed independently of all other cases.

Remember, these four are only practice cases to familiarize you with these auditing situations.

ABD INC.

1. THE COMPANY IS A NONDIVERSIFIED MANUFACTURING FIRM IN A DECLINING INDUSTRY WITH SALES OVER THE PAST THREE YEARS DECLINING AT A 50% RATE ANNUALLY.
2. THE COMPANY IS A PUBLICLY HELD CORPORATION WITH STOCKHOLDERS BEING THE PRIMARY USERS OF ITS FINANCIAL STATEMENTS (4,000,000 SHARES OF COMMON STOCK ARE OUTSTANDING).
3. THE COMPANY'S MANAGEMENT HAS BEEN COMPLETELY UNCOOPERATIVE IN ALL DEALINGS WITH YOUR FIRM AND IN CONNECTION WITH YOUR CURRENT AUDIT.
4. THE COMPANY'S MANAGEMENT FOLLOWS UNCONSERVATIVE ACCOUNTING POLICIES IN THE AREAS OF INCOME DETERMINATION AND ASSET VALUATION, AND ITS REPORTED EARNINGS GENERALLY ARE VIEWED AS OF LOW QUALITY
5. YOUR REVIEW AND EVALUATION OF THE COMPANY'S SYSTEM OF INTERNAL CONTROL DISCLOSED MANY WEAKNESSES IN THE HANDLING OF ACCOUNTS RECEIVABLE AND RELATED ACCOUNTS (E.G. SALES, CASH), AND COULD NOT BE RELIED UPON.
6. THE PROPOSED ADJUSTMENT REDUCED THE CURRENT RATIO FROM 1.7 - 1 TO 1.3 - 1. (A 2 - 1 RATIO IS NORMAL FOR THE INDUSTRY)
7. THE PROPOSED ADJUSTMENT WILL DECREASE CURRENT NET INCOME AFTER TAXES BY 13.4%.
8. THE AFTER-TAX IMPACT OF THE PROPOSED ADJUSTMENT WILL REVERSE AN OTHERWISE UPWARD EARNINGS PER SHARE TREND THAT HAS PREVAILED OVER THE PRECEDING THREE YEARS (I.E., EPS INCREASES OVER PRECEDING YEARS BEFORE THE IMPACT OF THE PROPOSED ADJUSTMENT; THE PROPOSED ADJUSTMENT CAUSES EPS OF THE CURRENT YEAR TO DECLINE BELOW EPS OF THE PRECEDING YEAR).

-
1. IN MY OPINION, THE PROPOSED ADJUSTMENT TO THE ALLOWANCE FOR DOUBTFUL ACCOUNTS IS;

CLEARLY IMMATERIAL |-----| CLEARLY MATERIAL

2. ASSUMING THAT THE COMPANY DOES NOT BOOK THE PROPOSED ADJUSTMENT, I WOULD LIKELY ISSUE:

 AN UNQUALIFIED OPINION A QUALIFIED OPINION AN ADVERSE OPINION

APPENDIX B

AUDIT CASE WITH ALL 'HIGH' LEVELS OF CUES

EJR INC.

1. THE COMPANY IS A DIVERSIFIED MANUFACTURING FIRM IN AN EXPANDING INDUSTRY WITH SALES OVER THE PAST THREE YEARS INCREASING AT A 15% RATE ANNUALLY.
2. THE COMPANY IS A CLOSELY HELD CORPORATION WITH CREDITORS BEING THE PRIMARY USERS OF ITS FINANCIAL STATEMENTS (40,000 SHARES OF COMMON STOCK ARE OUTSTANDING).
3. THE COMPANY'S MANAGEMENT HAS BEEN COMPLETELY COOPERATIVE AND OPEN IN ALL DEALINGS WITH YOUR FIRM AND IN CONNECTION WITH YOUR CURRENT AUDIT.
4. THE COMPANY'S MANAGEMENT FOLLOWS CONSERVATIVE ACCOUNTING POLICIES IN THE AREAS OF INCOME DETERMINATION AND ASSET VALUATION, AND ITS REPORTED EARNINGS GENERALLY ARE VIEWED AS OF HIGH QUALITY.
5. YOUR REVIEW AND EVALUATION OF THE COMPANY'S SYSTEM OF INTERNAL CONTROL DISCLOSED NO MATERIAL WEAKNESSES IN ACCOUNTING FOR AND HANDLING OF ACCOUNTS RECEIVABLE AND RELATED ACCOUNTS (E.G., SALES, CASH).
6. THE PROPOSED ADJUSTMENT REDUCES THE CURRENT RATIO FROM 2.5 - 1 TO 2.1 - 1. (A 2 - 1 CURRENT RATIO IS NORMAL FOR THE INDUSTRY.)
7. THE PROPOSED ADJUSTMENT WILL DECREASE CURRENT NET NET INCOME AFTER TAXES BY 2.7%.
8. THE AFTER-TAX IMPACT OF THE PROPOSED ADJUSTMENT WILL NOT REVERSE AN UPWARD EARNINGS PER SHARE TREND THAT HAS PREVAILED OVER THE PRECEDING THREE YEARS.

-
1. IN MY OPINION, THE PROPOSED ADJUSTMENT TO THE ALLOWANCE FOR DOUBTFUL ACCOUNTS IS:

CLEARLY
IMMATERIAL

CLEARLY
MATERIAL

2. ASSUMING THAT THE COMPANY DOES NOT BOOK THE PROPOSED ADJUSTMENT, I LIKELY WOULD ISSUE:

___ AN UNQUALIFIED OPINION ___ A QUALIFIED OPINION ___ AN ADVERSE OPINION

APPENDIX C

AUDIT CASE WITH ALL 'LOW' LEVELS OF CUES

TYG INC.

1. THE COMPANY IS A NONDIVERSIFIED MANUFACTURING FIRM IN A DECLINING INDUSTRY WITH SALES OVER THE PAST THREE YEARS DECLINING AT A 15% RATE ANNUALLY.
2. THE COMPANY IS A PUBLICLY HELD CORPORATION WITH STOCKHOLDERS BEING THE PRIMARY USERS OF ITS FINANCIAL STATEMENTS (4,000,000 SHARES OF COMMON STOCK ARE OUTSTANDING).
3. THE COMPANY'S MANAGEMENT HAS BEEN LESS THAN COMPLETELY COOPERATIVE AND OPEN IN ALL DEALINGS WITH YOUR FIRM AND IN CONNECTION WITH YOUR CURRENT AUDIT.
4. THE COMPANY'S MANAGEMENT FOLLOWS UNCONSERVATIVE ACCOUNTING POLICIES IN THE AREAS OF INCOME DETERMINATION AND ASSET VALUATION, AND ITS REPORTED EARNINGS GENERALLY ARE VIEWED AS OF LOW QUALITY.
5. YOUR REVIEW AND EVALUATION OF THE COMPANY'S SYSTEM OF INTERNAL CONTROL DISCLOSED INADEQUATE SEGREGATION OF DUTIES IN THE HANDLING OF ACCOUNTS RECEIVABLE AND RELATED ACCOUNTS (E.G., SALES, CASH).
6. THE PROPOSED ADJUSTMENT REDUCES THE CURRENT RATIO FROM 2.1 - 1 TO 1.7 - 1. (A 2 - 1 CURRENT RATIO IS NORMAL FOR THE INDUSTRY.)
7. THE PROPOSED ADJUSTMENT WILL DECREASE CURRENT NET INCOME AFTER TAXES BY 7.3%.
8. THE AFTER-TAX IMPACT OF THE PROPOSED ADJUSTMENT WILL REVERSE AN OTHERWISE UPWARD EARNINGS PER SHARE TREND THAT HAS PREVAILED OVER THE PRECEDING THREE YEARS (I.E., EPS INCREASES OVER PRECEDING YEARS BEFORE THE IMPACT OF THE PROPOSED ADJUSTMENT; THE PROPOSED ADJUSTMENT CAUSES EPS OF THE CURRENT YEAR TO DECLINE BELOW EPS OF THE PRECEDING YEAR).

-
1. IN MY OPINION, THE PROPOSED ADJSUTMENT TO THE ALLOWANCE FOR DOUBTFUL ACCOUNTS IS:

CLEARLY
IMMATERIAL



CLEARLY
MATERIAL

2. ASSUMING THAT THE COMPANY DOES NOT BOOK THE PROPOSED ADJSUTMENT, I LIKELY WOULD ISSUE:

 AN UNQUALIFIED OPINION A QUALIFIED OPINION AN ADVERSE OPINION

APPENDIX D

SAMPLE AUDIT CASE

ROG INC.

1. THE COMPANY IS A NONDIVERSIFIED MANUFACTURING FIRM IN A DECLINING INDUSTRY WITH SALES OVER THE PAST THREE YEARS DECLINING AT A 15% RATE ANNUALLY.
2. THE COMPANY IS A CLOSELY HELD CORPORATION WITH CREDITORS BEING THE PRIMARY USERS OF ITS FINANCIAL STATEMENTS (40,000 SHARES OF COMMON STOCK ARE OUTSTANDING).
3. THE COMPANY'S MANAGEMENT HAS BEEN LESS THAN COMPLETELY COOPERATIVE AND OPEN IN ALL DEALINGS WITH YOUR FIRM AND IN CONNECTION WITH YOUR AUDIT.
4. THE COMPANY'S MANAGEMENT FOLLOWS CONSERVATIVE ACCOUNTING POLICIES IN THE AREAS OF INCOME DETERMINATION AND ASSET VALUATION, AND ITS REPORTED EARNINGS GENERALLY ARE VIEWED AS OF HIGH QUALITY.
5. YOUR REVIEW AND EVALUATION OF THE COMPANY'S SYSTEM OF INTERNAL CONTROL DISCLOSED NO MATERIAL WEAKNESSES IN ACCOUNTING FOR AND HANDLING OF ACCOUNTS RECEIVABLE AND RELATED ACCOUNTS (E.G., SALES, CASH).
6. THE PROPOSED ADJUSTMENT REDUCES THE CURRENT RATIO FROM 2.1 - 1 TO 1.7 - 1. (A 2 - 1 CURRENT RATIO IS NORMAL FOR THE INDUSTRY.)
7. THE PROPOSED ADJUSTMENT WILL DECREASE CURRENT NET INCOME AFTER TAXES BY 2.7%.
8. THE AFTER-TAX IMPACT OF THE PROPOSED ADJUSTMENT WILL REVERSE AN OTHERWISE UPWARD EARNINGS PER SHARE TREND THAT HAS PREVAILED OVER THE PRECEDING THREE YEARS (I.E., EPS INCREASES OVER PRECEDING YEARS BEFORE THE IMPACT OF THE PROPOSED ADJUSTMENT; THE PROPOSED ADJUSTMENT CAUSES EPS OF THE CURRENT YEAR TO DECLINE BELOW EPS OF THE PRECEDING YEAR).

1. IN MY OPINION, THE PROPOSED ADJUSTMENT TO THE ALLOWANCE FOR DOUBTFUL ACCOUNTS IS:

CLEARLY
IMMATERIAL

CLEARLY
MATERIAL

2. ASSUMING THAT THE COMPANY DOES NOT BOOK THE PROPOSED ADJUSTMENT, I LIKELY WOULD ISSUE:

___AN UNQUALIFIED OPINION ___A QUALIFIED OPINION ___AN ADVERSE OPINION

THE ACQUISITION OF EXPERTISE IN AUDITING:
A JUDGMENTAL ANALYSIS

by

RICHARD THOMAS ETTENSON

B.A. Fairleigh Dickinson University, 1978

AN ABSTRACT OF A MASTER'S THESIS

submitted in partial fulfillment of the

requirements for the degree

MASTER OF SCIENCE

Department of Psychology

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Manhattan, Kansas

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ABSTRACT

The present study took a descriptive approach to human judgment to examine the manner in which some skills of an expert develop. Specifically, the judgment processes of individuals from auditing, a particular area of business, were investigated. The primary goal of this research was to determine whether academic training in auditing alone is sufficient for one to acquire auditing expertise, and if not, what role does practical working experience play in the acquisition of expertise?

This research goal was approached by examining the judgment skills/strategies of three groups of participants: auditing students, audit seniors, and audit partners (the experts), each varying as to their degree of academic training and practical working experience. To determine their strategies, each of these groups were required to make judgments of "materiality". The concept of materiality, although used with great regularity, is not well understood within the auditing profession. Thus, a secondary goal of this research was to examine some specific factors that effect materiality judgments.

The results indicate that the auditing students and the auditing professionals (i.e., the audit partners and audit seniors) used different judgmental strategies to determine materiality. Moreover, there was wide agreement among the professionals as to the specific strategy to apply, whereas the students exhibited no such agreement. In addition, it was found that certain factors do indeed effect materiality judgments. The implications of these results with regard to the research goals are discussed.