

Judgment and Decision-Making Research in Auditing and Accounting: Future Research Implications of Person, Task, and Environment Perspective

RAJNI MALA, *Macquarie University*

PARMOD CHAND, *Macquarie University*

Received on December 12, 2012; editorial decision completed on November 20, 2014.

ABSTRACT

The discipline of accounting and auditing has increasingly recognized judgment and decision making (JDM) as highly important attributes in the profession because individuals such as managers, auditors, financial analysts, accountants, and standard setters make pivotal judgments and decisions. Many studies undertaken in this domain of research also substantiate the significance of JDM in accounting and auditing. This study evaluates all the papers published in 10 accounting journals among the leading ones from 1980 to 2010 that fall within the domain of JDM research. The categorization of the studies reviewed in this paper is based on Bonner's (1999) three major determinants of JDM: *Person*, *Task*, and *Environment* variables. The review highlights the progress in the literature over the past three decades and also identifies the methodological limitations of previous research. The identified limitations will be useful for improving the research method of future JDM studies in accounting and auditing. The review also draws inferences on how JDM research in auditing, which is well established, could usefully guide future JDM research in financial accounting.

Keywords Decision making; Person variable; Task variable; Environment variable

RECHERCHES SUR LE JUGEMENT ET LA PRISE DE DÉCISIONS EN AUDIT ET EN COMPTABILITÉ: RÉPERCUSIONS SUR LES TRAVAUX FUTURS DE LA PERSPECTIVE PERSONNE-TÂCHE-ENVIRONNEMENT

RÉSUMÉ

Les disciplines de la comptabilité et de l'audit reconnaissent plus que jamais l'importance capitale des attributs de la profession que sont le jugement et la prise de décisions, compte tenu de l'incidence déterminante des jugements que portent les gestionnaires, les auditeurs, les analystes financiers, les comptables et les autorités de réglementation, ainsi que des décisions qu'ils prennent. Maintes études réalisées dans ce champ de recherche confirment aussi l'importance du jugement et

de la prise de décisions en comptabilité et en audit. Les auteurs évaluent ici tous les travaux parus entre 1980 et 2010 dans dix publications comptables de premier plan et portant sur des sujets qui relèvent de ce champ de recherche. Le classement des travaux étudiés par les auteurs repose sur les trois principaux déterminants du jugement et de la prise de décisions selon Bonner (1999), soit les variables de la personne, de la tâche et de l'environnement. L'étude fait ressortir l'évolution des travaux publiés au cours des trois dernières décennies et met également en évidence les limites méthodologiques de ces travaux. La recension de ces limites permettra d'améliorer les méthodes de recherche qui seront utilisées dans les travaux à venir sur le jugement et la prise de décisions en comptabilité et en audit. Les auteurs tirent également des conclusions quant à la façon dont la recherche sur le jugement et la prise de décisions en audit, dont les assises sont solides, pourrait orienter utilement la recherche sur le jugement et la prise de décisions en comptabilité générale.

Mots clés : prise de décisions, variable de l'environnement, variable de la personne, variable de la tâche

INTRODUCTION

Professional judgment is regarded as the cornerstone of accounting and auditing (Trotman, 2006: 6). The creation of the *Research Opportunities in Auditing Program* (Peat, Marwick, Mitchell, and Co. (1976)) and the publication of the influential American Accounting Association Report (Committee on Human Information Processing, 1977) brought accounting and auditing judgment and decision-making (JDM) research into the scholarly limelight (Solomon and Trotman, 2003: 395). As a field of research, JDM examines the judgments and decisions of individuals and groups (Trotman, 2006: 8). The discipline of accounting and auditing has increasingly recognized the attributes of JDM as being highly important in the profession because individuals such as managers, auditors, financial analysts, accountants, and standard setters make pivotal judgments and decisions. The need for auditors to “exercise professional judgment” emerges 244 times in the international standards on auditing (Pillar, 2005); and the International Financial Reporting Standards (IFRS), being principles-based, require the use of professional judgment as a norm.

Many studies also substantiate the significance of JDM in accounting and auditing. Audit monographs and reviews on JDM studies, for example, include Libby (1981), Libby and Lewis (1982), Ashton (1982), Libby and Luft (1993), Ashton and Ashton (1995), Bell and Wright (1995), Solomon and Shields (1995), Trotman (1996), Solomon and Trotman (2003), Nelson and Tan (2005), and Humphrey (2008). These reviews vary in relation to how prior research in JDM is categorized. For example, Libby and Luft (1993) have shown how the literature has progressed in terms of the effects of knowledge, ability, motivation, and environment on the performance of auditors, while Solomon and Trotman (2003) categorized the literature into multi-person judgment, heuristics and bias, knowledge and

memory, probabilistic judgment, environment and motivation, and policy capturing. Nelson and Tan (2005) divided the auditing JDM literature into three broad areas: the audit task, the auditor and his/her attributes, and the interaction between the auditor and other stakeholders in task performance.

Primarily, JDM research in accounting examines two major issues. First is the quality of an individual's or group's JDM, that is, the measurement of the performance of individuals when they are engaged in tasks requiring JDM. Second, JDM research examines the determinants of both high and lower quality judgments, that is, the factors that affect JDM (Bonner, 1999: 386). This paper focuses on reviewing the studies that have examined the determinants of JDM, in particular, the factors that affect the JDM of individuals. An important contribution of this study is that the review also draws inferences on how JDM research in auditing, which is well established, could usefully guide future JDM research in financial accounting.

It is important that individuals make good quality judgments, because the quality of an individual's judgment can affect his or her professional reputation and performance while also having an impact on other stakeholders, including fellow employees, business owners, and the institution or organization. Equally, a poor judgment can lead to major financial loss, triggering a filtering impact on people who rely on others' JDM. For example, investors rely on forecasts by financial analysts to make investment decisions, and if a financial analyst makes poor judgments, the investor will suffer. Poor decisions of this nature can also lead to negative legal outcomes such as payouts in civil litigation (Erickson, Maydew, and Felix, 2000).

The studies reviewed here are categorized on the basis of Bonner's (1999) three major determinants of JDM: *Person*, *Task*, and *Environment* variables. These three variables are integral components of the JDM process used by an accountant or an auditor. Various personal characteristics of the accountant (e.g., knowledge, expertise, information-processing capabilities, ability to use decision-aids and prior beliefs from past experiences) influence the individual's judgment. The task variables relate to the nature and dimensions of the task per se (e.g., its presentation format, complexity and risk) and these attributes of task also influence the accountant's judgment. The environmental variables relate to the situations in which individuals find themselves when they perform a JDM task; they are not related to any one task. Time pressure, internal control, corporate governance, and accountability are the types of environmental attributes that have the capacity to influence JDM, as these attributes can change the task requirements as well as the amount of knowledge, effort, and motivation that the decision maker must bring to the task (Libby and Luft, 1993: 435).

This paper evaluates all the papers published in 10 accounting journals among the leading ones during the period 1980–2010 that fall within the domain of JDM research: *The Accounting Review (AR)*; *Accounting and Business Research (ABR)*; *Accounting Horizons (AH)*; *Behavioral Research in Accounting (BRIA)*; *Journal of*

Accounting Research (JAR); *Auditing: A Journal of Practice and Theory (AJPT)*; *Journal of Accounting and Economics (JAE)*; *Contemporary Accounting Research (CAR)*; *Accounting, Organizations and Society (AOS)*; and *British Accounting Review (BAR)*. The basis on which the 10 journals were selected for this study is that 8 of the 10 journals (*The Accounting Review*, *Accounting Horizons*, *Behavioural Research in Accounting*, *Journal of Accounting Research*, *Auditing: A Journal of Practice and Theory*, *Journal of Accounting and Economics*, *Contemporary Accounting Research* and *Accounting, Organizations and Society*) are based on journal ranking by citations weighted by research method and specialty area (Chan, Seow, and Tam, 2009) and the remaining two journals (*British Accounting Review* and *Accounting and Business Research*) are chosen because they are A-ranked journals in the rankings issued by Excellence for Research in Australia (ERA) and contain a number of studies in the area of JDM.

Using Bonner's (1999) three major determinants of JDM, the review highlights the progress in literature over the past three decades. According to Trotman, Tan, and Ang (2011), the 1980s was an extremely inspiring time for JDM research because important themes such as probabilistic judgments on heuristics and bias, expertise paradigm, the use of decision aids and group decision making dominated the research. In addition to Bonner's (2008) review, this review also identifies the methodological limitations of previous research. The identified limitations will be useful for improving the research method of future studies in auditing and financial accounting. Additionally, this review draws inferences on how JDM research in auditing, which is well established, could usefully guide future JDM research in financial accounting.

The remainder of the paper is organized as follows. The second section provides an overview of the studies under review, that is, those studies that relate to the scope of accounting JDM research. The third section demonstrates the relevance of auditing judgment to accounting judgment. The fourth to sixth sections evaluate the studies under the three categories of the *Person*, *Task*, and *Environment* variables and also provide suggestions for prospective future research in the area of financial accounting. The seventh section evaluates the research methods of the studies reviewed. The last section provides the conclusion and implications of this study.

SCOPE OF ACCOUNTING JUDGMENT AND DECISION-MAKING RESEARCH

JDM research in accounting, a part of the larger area of psychological research called "behavioural decision theory," studies how professional accountants' judgments and decisions are made and identifies ways to improve them (Trotman, 1998: 115). To understand the importance of JDM in accounting, it is important to be acquainted with the terms of JDM. For the purpose of this study, judgment refers to "forming an idea, opinion or estimate about an object, an event, a state, or another type of phenomenon" and the term "decision" refers to "making up one's mind about the issue at hand and taking a course of action" (Bonner, 1999: 385). According to Brown, Collins, and Thornton (1993: 275), "accounting standards provide accoun-

tants with incomplete direction and require them to exercise professional judgment.” Accordingly, the financial reports of business enterprises are the end products of numerous judgments and decisions (Hronsky and Houghton, 2000: 123).

Over the past few decades, several prestigious commissions and other bodies have referred to the relationship between accounting standards and judgment. For example, the National Commission on Fraudulent Financial Reporting (Cohen Commission) (1978: 16) in its report commented that:

Judgment pervades accounting and auditing. It is exercised in considering whether the substance of transactions differs from their form, in resolving questions of materiality and adequacy of disclosure, in deciding whether an estimate can be made of the effects of future events on current financial statements, and in allocating receipts and expenditures over time and among activities.

From a practical perspective, accountants or managers who produce accounting information choose accounting methods and make judgments that best suit their objectives (Clor-Proell, 2009). Auditors use professional judgments to make decisions about the accuracy of financial statements (Lindberg, 1999). Analytical procedures, which provide important evidence to the external auditor for the initial planning of audit work, require the application of professional judgment (Kaplan, 1988). Finally, professional institutions that regulate the work of accountants and auditors make overarching decisions and judgments on the appropriate disclosure and presentation of financial information.

RELEVANCE OF AUDIT JUDGMENT TO FINANCIAL ACCOUNTING JUDGMENT

Although accounting and auditing are related fields from both a research and practical viewpoint, drawing generalizations from the auditing studies about accounting judgments may not always hold true due to the differences in the types of work performed by auditors and accountants (Ashton and Ashton, 1995). Auditing is an independent review by accounting firms who substantiate the work of accountants by verifying the recording of business transactions according to the accounting standards (Ashton and Ashton, 1995). Accounting, on the other hand, is the process of analyzing business transactions and preparing annual reports by applying accounting standards. The accounting judgments entail the recognition, measurement, and recording of business transactions by making decisions on appropriate accounting policies, such as the choice of inventory-valuation method, assets valuation methods, and depreciation methods.

Accounting judgment is also related to deciding appropriate accounting estimates, such as the percentage of provision for bad debt and confirmation of bad debt loss, the economic life of fixed assets and the determination of residual values. These judgments and decisions by accountants must be made on the substance of the transactions and must depict accurate accounting information. Because there are large numbers of options available, with vague criteria and

interpretations, particularly in principles-based accounting standards like IFRS, the judgments applied by accountants differ across jurisdictions as well as within jurisdictions (Nobes, 2006). On the other hand, according to Boritz (1986: 335), auditing judgment researches “focus on the potential implications of policy enhancements in areas such as development and modifications of auditing methods, standards and procedures, approaches to training and supervision and creation of computer based decision-aids.” These differences in the types of judgments made by accountants and auditors illustrate that their concerns are different. Accountants are concerned about the accuracy of the accounting policies and estimates applied, whereas auditors are concerned about the accuracy of the accounting information provided (Mock and Klersey, 1989).

Through experimental analysis, previous studies have primarily investigated the effects of person, task, and environment variables on auditing JDM. Accordingly, it is important to identify whether the theories and findings from the auditing research on JDM can be applied to financial accounting.

The individual studies share a common attempt to identify potential factors that may affect judgments. The next three sections individually discuss the research relevant to the *Person*, *Task*, and *Environment* variables in 10 journals among the leading ones during 1980–2010 and also provide suggestions for prospective future research in the area of financial accounting.

STUDIES THAT CLASSIFY THE JUDGMENT AND DECISION-MAKING FACTOR AS A PERSON VARIABLE

Mautz and Sharaf (1961: 35) pointed out that “before making a judgment on a value problem, it should be apparent that broad experience, a perceptive memory, controlled imagination and a sound understanding of the functions and responsibility of the profession are invaluable aids to the exercise of sound judgment.” Person variables relate to the characteristics the decision maker brings to the task, such as knowledge, expertise, information-processing abilities, use of decision aids, and prior beliefs or “anchoring,” as Tversky and Kahneman (1974) describe it (see Bonner, 1999; Nelson and Tan, 2005). Accountants must constantly depend on their knowledge and decision-making skills to come up with the best answers to different types of problems under a wide range of conditions; hence, it is of both theoretical and practical interest to investigate the effectiveness of these attributes. Studies that considered the JDM factor as a *Person* variable were attempts to examine the influence of (1) knowledge, (2) expertise, (3) information-processing abilities, (4) use of decision aids, and (5) prior beliefs (anchoring) on various dependent variables such as making decisions about the going concern of an entity, predicting financial statement errors, the recall of information, and fraud assessments.

The following subsections review the studies relevant to the *Person* variable, looking at each attribute or quality in turn. Subsequent subsections evaluate the

research methods employed in these studies, identify the methodological limitations of previous research and suggest avenues for future research in the area of financial accounting which, compared to research in auditing, has been largely ignored.

Knowledge

In the past few years, a considerable amount of research associated with auditor judgment has elicited several concerns about the way audit tasks are carried out and the types of education and training that would assist individuals, that is, how knowledge might affect the approach to judgment and help in better decision making (Knechel, 2001: 695). As Waller and Felix (1984: 383) point out, “the professional auditor acquires a complex network of knowledge over his or her years of experience: knowledge that simply cannot be obtained in the classroom.”

In the 1980s, much interest centered on examining the differences in judgments between auditors and novice students. Using students and auditors, Butt (1988) showed that judgments relating to the frequency of errors based on direct experience compared with indirect experience were more accurate.¹ Overall, the study illustrated that auditors performed slightly better than students in a specific auditing task, but no differences were found between the two groups in a generic audit task.

Frederick and Libby (1986) is regarded as the first study that attempted to show how knowledge differences affect the judgment of auditors. By using Tversky and Kahneman’s (1983) conjunction paradigm, the study showed that experienced auditors have both knowledge of relations among control weaknesses and accounts errors, and of relations among accounts, and that this knowledge determines their judgment behavior. On the other hand, less experienced auditors possess only knowledge of account relations, and this is the knowledge that determines their judgment behavior. Frederick and Libby (1986) made a significant contribution by pointing out that even understanding experts’ use of heuristics and their cognitive abilities requires consideration of their knowledge, because knowledge interacts with the ability to determine judgment. These findings showed the importance of studying the effects of expertise on professional judgments, and this will be discussed in detail in the next subsection.

In the early 1990s, the knowledge literature expanded to include the “schema-based framework,”² that is, how knowledge is structured. Choo and Trotman’s

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1. Direct experience includes uncovering an error personally or participating in an audit in which an error is found and discussed, while indirect experience relates to receiving summary data about the frequency of occurrence of a particular type of accounting error in the past.
 2. A schema-based framework organizes memory and plays a fundamental role in all cognitive activities (e.g., remembering, predicting, explaining, and formulating an opinion regarding a client’s financial reports) (Waller and Felix, 1984)

(1991) study is an example of this. They adopted such a framework and showed that with respect to knowledge structures, there were differences between experienced and inexperienced auditors in the number, type, and clustering of items that were recalled. These findings imply that experienced auditors' inferences are based on the way information is organized in the memory.

In the mid-1990s, the literature extended to examine the ways in which auditors organize knowledge in making decisions. There was a general concern that the psychological theories might not map well into the domain of auditing. Bedard and Graham (1994), using observations made during the process of knowledge elicitation for development of Risk Adviser, an expert system for audit risk assessment, provided insight into auditors' knowledge organization and decision processes. They found that the knowledge of experienced auditors for performing risk assessment was more client-centered than knowledge relevant to income tax accrual. These differences in the auditors' knowledge indicate that risk assessment of a client is a less structured task than a task related to income tax accrual. The findings showed that "framing," which is "the induction of differential response through use of particular forms of a given question or issue" (Bedard and Graham, 1994: 79), is quite important in accessing negative issues from memory regarding particular clients. Framing could also help to prevent the "successful imposition of a positive frame by a client seeking to misrepresent its financial situation" (Bedard and Graham, 1994: 81). This study has implications for practitioners regarding how framing could help to improve audit effectiveness.

Expertise

Research in this area investigates the relationship between expertise and professional judgment. Expert knowledge is important for understanding how and why a better performance is achieved when an individual becomes more experienced (Nelson and Tan, 2005: 49).

Ashton and Kramer (1980) first documented that students behave similarly to auditors in such measures as cue utilization, consensus, and consistency in making judgments. The findings showed no significant differences between the judgments of students and auditors, and the authors concluded that, when feasible, future behavioral accounting research projects should include student subjects, in addition to real-world subjects of interest, to evaluate the importance of experience, wealth, age, or other factors impacting on the issue under investigation. Ashton and Kramer (1980) used accounting students and auditors as subjects, whereas Messier (1983) used 29 audit partners with varying levels of experience and showed that only consensus of the audit partners' materiality/disclosure judgments was affected by experience levels and firm type. The judgment stability or self-insight of the individuals was not affected by these variables.

In the 1990s, the literature on experience progressed to include the type of information used by auditors in their decision making. These studies had impor-

tant practical implications because they highlighted that, as accountants gain more experience, they are able to provide better professional judgments. Bedard and Biggs (1991) investigated whether it is general experience or domain-specific experience which is more highly associated with improved professional judgment when auditors seek explanations from clients regarding material findings. Using an experiment, where the given task was complex, and which only experienced auditors could solve, they found that compared to general experience (number of years of experience), it is domain-specific experience (experience in the particular domain of the financial statement error) that improves professional judgment. The study clearly points out the importance of developing more specific measures of experience as surrogates for expertise in audit judgment research rather than using only general experience as the proxy for experience.

Experience as an important determinant of performance was further examined by Frederick, Heiman-Hoffman and Libby (1994). One of their main research questions was to examine how the knowledge bases of auditors differ according to individual levels of experience. An experiment was conducted with 51 new audit managers with a median of five years' audit experience, 43 staff auditors with a median of one year's audit experience, and 41 students with no auditing experience. As expected, the results showed that audit knowledge is mostly gained from experience, because students were unable to categorize errors based on their underlying meaning for either the transaction cycle or the audit objective; rather, they sorted errors with similar wording into the same category. The Anderson and Malotta (1994) study indicated that experience is crucial when there is negative audit evidence, but when audit evidence is positive the levels of experience have no effect on judgment. The findings enhance our understanding of the effect of experience-related differences on audit judgment tendencies and thus add to the general knowledge base concerning the role of expertise in auditing. In effect, it could be argued that in terms of audit effectiveness, it is better for inexperienced auditors to be more risk averse or conservative in their approach to the audit process. This allows them, in spite of their lack of knowledge, to root out potentially critical problems that can be reviewed later by more experienced auditors. Conversely, these findings also raise the question of whether less experienced auditors basing their judgments on negative audit evidence have implications for audit effectiveness and efficiency. Messier and Tubbs (1994) extended the audit research to find the impact of experience on the recency effect of audit evidence, as prior studies have shown that the recency effect of audit evidence which is both positive and negative relating to a business transaction may lead to a decrease in audit efficiency and effectiveness. By undertaking an experiment on auditors, Messier and Tubbs showed that experience mitigates the recency effects related to collectability from accounts receivable in audit judgment.

An additional branch of the expertise literature has investigated the significance of the experience effect when task complexity is explicitly considered. Explaining the effect of experience and task complexity is the work of Abdolmohammadi and Wright (1987), which showed that significant differences in judgments were consis-

tently found between experienced auditors and other auditors for unstructured and semistructured tasks. The findings showed that experienced auditors are able to make more accurate decisions about complex tasks than inexperienced auditors. Ho (1994) extended the expertise literature on information to show that there were differences in the judgments of experienced and less experienced auditors who made decisions regarding the going concern of a firm. Further to this, Shelton (1999) investigated the effect of irrelevant information in the going-concern judgments of less experienced auditors compared to the judgments of more experienced auditors. The findings showed that experience reduces the influence of irrelevant information in auditor judgment. More experienced auditors (partners and managers) were not influenced by the presence of irrelevant information in making a going-concern judgment. On the other hand, less experienced auditors (seniors) were influenced by the presence of irrelevant information. This study made a significant contribution to accounting practice by highlighting that experienced auditors could detect and correct the judgments made in audit reviews.

Haynes, Jenkins, and Nutt (1998), using an experiment, investigated whether auditors assume the role of client advocate. They found that auditors do not automatically assume a client advocacy role, but when the clients' interests were made paramount, experienced auditors assumed a client advocacy role. This exploratory study showed that the audit judgment varied with the number of years of experience. It showed a positive relationship between audit experience and the auditors' tendency to support client interest.

In the first decade of the 2000s, the expertise literature advanced to pursue a cognitive explanation of accountants' behavior and to explain what happens to the differences in judgments when the task is simple. Earley (2002) provides a good example of this. The study showed that experienced auditors provide a better judgment on the discount rates used in real estate valuation than less experienced auditors. Further to this, Lehmann and Norman (2006) showed that more experienced individuals can solve complex problems better than less experienced individuals because they have better knowledge structures.

Hoffman, Joe, and Moser (2003) added to the literature by studying the order of information processing. They compared the judgments of experienced and inexperienced auditors in a constrained versus an unconstrained information-processing situation and found that experienced auditors' going-concern judgments differed from inexperienced auditors' judgments only when processing was unconstrained. Constraining the experienced auditors' processing practice prevented them from attending to the same level of positive evidence as they did when their processing was unconstrained, and this resulted in lower quality going-concern judgments in the constrained processing condition. This differential attention to evidence accounted for the differences in judgment. This study provides evidence that "forcing experienced auditors to process information sequentially when they are more accustomed to processing it simultaneously can have a detrimental effect on their judgments" (Hoffman et al., 2003: 710).

Studies by Rose (2007) and Agoglia, Beaudoin, and Tsakumis (2009) showed the expansion of the expertise literature from information selection abilities to task-specific knowledge and expertise. Rose (2007) found that auditors with fraud-specific experience made better judgments regarding fraud than those with no fraud-specific experience when there was aggressive reporting. These findings have practical implications; for example, audit firms can be more confident in their judgments when auditors with fraud-specific experience are involved in the investigation of misstatements in reporting. Additionally, Agoglia et al. (2009) found that review team task-specific experience played a significant role in mitigating the effect of the fraud assessment documentation structure on auditor fraud risk judgments. They found that experienced preparers were less influenced by a component documentation structure than their less experienced counterparts.

Information Processing

An important issue in audit judgment research has been how information is combined when making judgments, and in particular, whether auditors' judgments involve configural cue usage (Hooper and Trotman, 1996: 125).³ According to Nelson and Tan (2005), there has been a significant focus since the early 1970s on how information is combined and processed cognitively.

Throughout the 1990s, there was great interest in whether accountants were able to process information configurally or whether they became susceptible to the heuristics and bias described in the psychology literature. The works of Brown and Solomon (1991) and Hooper and Trotman (1996) are examples of studies in this area. Evidence from the Brown and Solomon (1991) study indicates that a high proportion of auditors processed the available information configurally. Based on the findings of Brown and Solomon (1991), Hooper and Trotman (1996) examined some of the conditions that may have facilitated the development of the ability of auditors to configurally process the available information. The study found that the type of compensatory form and level of consensus was higher for auditors who processed information configurally than for those who did not.

Decision Aids

The person aspect in this study is perceived as including the ability to use decision aids. It is quite common in accounting to use decision aids to improve the professional judgments of individuals when there is a lack of knowledge and expertise. Decision aids vary from being relatively simple, such as checklists, audit programs, and other aspects of the audit software that are embedded in professional standards, to being more complex, such as computerized models (Messier, 1995). Research into the use of decision aids helps us to understand how these aids improve or bias the judgments made.

3. Configural information processing is "cognition in which the pattern (or configuration) of stimuli is important to the subsequent judgment/decision" (Brown and Solomon, 1990: 19).

In the 1980s, studies focused on the use of simple decision aids. For example, Butler's (1985) study showed that the five-step decision aid of a data structuring procedure helped auditors to make more accurate decisions when accepting or rejecting reported account balances. Boritz (1985) also examined the effect on audit judgments of data structuring techniques as a form of aid and found that the structure of information presentation appeared to assist with auditors' evaluations and plans. In an exploratory study, Strawser (1990) examined audit risk judgments using human information-processing methodology. His findings showed that auditors' judgments are not consistent with the audit risk model; rather, they demonstrate that while the audit risk model implicitly assigns an equal weight to each component, the lack of more explicit guidance leads to differences in judgments. The study highlighted that it is important to provide auditors with more explicit guidance while also suggesting that there is a need to modify the audit risk model. Using 105 auditors, Bonner et al. (1996) demonstrated that the checklist aid slightly improved the judgments of experienced auditors.

Anderson, Kaplan, and Reckers (1997) tested the influence of having auditors focus on explanations from an error versus non-error-dominated list of explanations as a type of decision aid. The findings showed that requiring auditors to focus on errors from an error-dominated list led to an increase in their assessment of error. By contrast, requiring auditors to focus on non-errors from a non-error-dominated list did not significantly decrease their assessment of error. These findings may reflect the greater emphasis auditors place on the effectiveness of the audit compared to audit efficiency. The results also showed that auditors' initial and revised probability of error estimates are significantly affected by client environment information.

Eining, Donald, and James (1997) examined the use of decision aids in the assessment of management fraud risk, which is seen as a complex decision process. They undertook an experiment that examined the use of an expert system decision aid compared to a simple decision aid and no decision aid. The results clearly showed that the expert system decision aid strongly assisted in detecting management fraud. The auditors using the expert system were able to differentiate the varying risk of management fraud significantly better than the auditors using the simple decision aid. This study showed that the way the decision aid is designed has an influence on judgment over and above the simple presence of a decision aid in the decision-making process. Bell and Carcello (2000) using survey data from a sample of 77 fraud engagements and 305 nonfraud engagements developed and tested a simple decision aid, a logistic regression model predicting the probability of fraudulent financial reporting. It was found that the logistic model was significantly more accurate than practising auditors in assessing risk for the 77 fraud observations; however, in the nonfraud case there was not a significant difference between model assessments and those of practising auditors. These findings show that even a simple decision aid is important in detecting fraudulent financial reporting.

Bedard and Graham (2002), using an experiment, examined whether auditors' identification of client-related risk factors is influenced by a decision aid orientation, that is, a "negative" focus where the client risk and its consequences are emphasized, or a "positive" focus where client risk is not emphasized. The findings of the study revealed that auditors using a negative decision aid orientation are able to identify more risk factors related to the client than auditors using a positive orientation. Bedard and Graham also found that decisions to apply substantive tests are more directly linked to specific evidence-gathering decisions than to direct risk assessments. Further, they found that auditors who are repeatedly linked to the clients recognize more risk factors.

Ng and Tan (2003) undertook an experiment on audit managers to discover the effects of two decision aids: the availability of authoritative guidance and the effectiveness of the client's audit committee. The results showed that the auditors' perceived negotiation outcome was jointly influenced by authoritative guidance availability and audit committee effectiveness. The authoritative guidance availability had a greater effect on the auditors' perceived negotiation outcomes in the absence of an effective audit committee compared to the outcomes in its presence. Adding to the concept of guidance as a decision aid, Feng and McVay (2010) showed that analysts place more weight on management guidance when they have an incentive to please management preceding an equity offering. The overweighting of the management guidance by the analysts leads to inaccurate forecasts, but this behavior by analysts pleases management because it helps to align the market's expectations with those of management.

The findings of the above studies show that on one hand, decision aids improve professional judgments, while on the other, their use can contribute to input bias designed to achieve predetermined outcomes.

Prior Beliefs

Psychology research has suggested that human reasoning is "prone to a 'confirmation bias' that hinders effective learning" and hence affects judgment (Klayman and Ha, 1987: 211). Tversky and Kahneman (1974) posit that individuals employ a heuristic rule of anchoring and adjustment, that is, the tendency to establish an initial starting point (e.g., prior experience) and then make adjustments from this anchor in light of additional data. Lord, Ross, and Lepper (1979) showed that subjects used different standards for criticizing conflicting evidence than for criticizing supporting evidence. While most of this work on prior beliefs has been done in the fields of psychology and social psychology, some research in accounting has also been conducted.

Studies conducted in the early 1980s provide much descriptive evidence about the effects of prior knowledge on JDM. For example, according to Waller and Felix (1984: 399), "the auditor manifests a strong tendency to seek and use confirmatory rather than disconfirmatory evidence." Moreover, Kida (1984) showed that

auditors weight causal data as more than equally diagnostic compared to noncausal data in their decision-making processes, providing support for the impact of intuitive cause-effect relations. Trotman and Sng (1989) extended Kida's (1984) study on auditors' choice of information cues and supported the findings that prior beliefs lead to different judgments compared to when there are no prior beliefs.

The study by Wright (1988) contributed to the prior belief literature by examining the effect of prior audit working papers (audit information regarding the client in past audit engagements) on audit effectiveness and audit efficiency. The results suggest that when auditors rely on old information regarding the client, there are adverse effects on audit efficiency because the auditors carry out unnecessary audit tests. Similarly, Butt and Campbell (1989) studied the effect of prior knowledge on the importance of information order and found that subjects with strong prior beliefs were unaffected by information order, whereas those with weak prior beliefs paid more attention to the recent information provided. For example, the judgments of the subjects with weak prior beliefs who received negative evidence after positive evidence was lower (more negative) than the judgments of subjects who received the negative evidence before the positive evidence. These findings have practical implications because they highlight that a single piece of negative evidence appears to have greater impact than a single piece of positive evidence when the negative evidence is presented last.

Frederickson, Peffer, and Pratt (1999) presented another contribution to the prior knowledge literature when they examined the interplay between accountants' incentives and correct judgment, and how judgment is affected by prior knowledge. They found that previous experience under a performance evaluation system can systematically bias decision makers' subsequent evaluations. Tan and Yip-Ow (2001) examined how the initial conclusion reached by the preparer of audit workpapers and the manner in which the preparer structures the associated evidence can influence the reviewer's judgment in an audit setting. Their results showed that when a preparer structured the memo to emphasize evidence that was consistent with her/his conclusions and de-emphasized inconsistent evidence, reviewers placed less weight on the conclusions reached by the preparer than when the memo was structured in a neutral fashion. These results have implications for the accounting profession, because reviewers generally work under the time pressure of tight deadlines, and it is possible that their sensitivity to stylization attempts may be reduced in such conditions. Using a multi-client audit context, Bhattacharjee, Maletta, and Moreno (2007) found that auditors' judgments are influenced by their exposure to similar judgment information on a prior client (contrast effect). They also found that the effects of this information from the previous decision carry over to influence subsequent, indirectly related decisions when no comparative information is available.

Research Methods

All but two of the studies reviewed under *Person* as a variable affecting JDM used an experimental method. Bedard and Graham (1994) used observations and Bell

and Carcello (2000) used survey data. Two of the three studies reviewed under the attribute of *Knowledge* (i.e., Frederick and Libby, 1986; Butt, 1988) used undergraduate and MBA students as surrogates for auditors. This clearly raises the question of whether these students share similar background experiences with the parties for whom they are acting as proxies, with possible implications for the findings of the studies. Additionally, these studies provided empirical evidence but did not provide real-world settings, which again has implications for the generalization of the findings. In the “real world,” there would typically be genuine incentives to make particular decisions with real and ongoing implications as a result of these decisions, which usually cannot be replicated in an experimental setting.

In most of the *Person* studies, the variables under study were measured on a Likert scale anchored from 0 to 10. Likert scaling presumes the existence of an underlying (latent or natural) continuous variable whose value characterizes the respondents’ attitudes and opinions (Likert, 1932). It is possible that when providing responses on the Likert scale, participants may not be completely honest. This may be intentional or unintentional. Respondents may base their answers on feelings toward the surveyor and may answer according to what they feel is expected of them as participants. These limitations of the Likert scale raise concerns about the validity of results. For example, Ho (1994) used a 7-point Likert scale, with 7 labeled “very strong,” 4 labeled “average,” and 1 labeled “very weak.” Shelton (1999) used a –5 to 5 scale for her studies. Lehmann and Norman (2006) used written protocols based on the nature of the task to measure the problem representation dependent variables. They asked participants to write a summary explaining the company’s financial condition to a supervisor. There is a possibility that participants’ responses will be misinterpreted by researchers, affecting the validity of the results. Additionally, by using different scaling and closed questions versus written protocols, the studies lack comparability.

Of the studies reviewed, a number of specific limitations in the research methods were observed. For example, Choo and Trotman (1991) examined the recall of information by experienced and inexperienced auditors and then related this to the inferences of auditors’ predictive judgments. Even though the subjects were not asked to make a predictive judgment before making the recall, it was suggested that, given the nature of the context, they probably formed their judgments “on-line” as evidence was encountered and before the recall exercise (Choo and Trotman, 1991). Earley (2002) investigated the impact of experience on client-provided discount rates for real estate valuations. This study had several limitations in its methodology because it was based on real estate audit engagements, hence it was difficult to determine whether the auditors had the prior knowledge to carry out valuation tasks (and other related analytical tasks), especially in high-risk circumstances in which discount rates provided by the client or an outside appraiser were apparently in line with industry reports. Butler (1985) had only seven usable responses in the control group and 11 in the aid group. This shows that the sample was very small, particularly given that the subjects were drawn from one big firm; hence, it was not a random selection of auditors.

The study by Frederick et al. (1994) stated that the study was not designed to determine whether experienced auditors' knowledge base enable them to audit more efficiently and effectively than inexperienced auditors. Additionally, the study by Messier and Tubbs (1994) did not specify the type of experience but referred to a more general experience based on years rather than the domain specific experience used in the Bedard and Biggs (1991) study. The exploratory nature of the study by Haynes et al. (1998) gave rise to concerns that when the client's interests were made paramount, experienced auditors assumed the client advocacy role; hence it is clear that empirical study is required to investigate this client advocacy by experienced auditors.

The Lehmann and Norman (2006) study may have contained selection bias because only volunteers from the membership of the Washington Society of CPAs were requested to take part in the study. Because the study was undertaken in the middle of tax season, the number of participants and their level of experience may have been limited. Additionally, the case in the study was related to an industry which is sensitive to economic conditions, fuel prices, etc., and has been exposed publicly due to its deregulation. As a result, the results of this study may not be generalizable to other industries (Lehmann and Norman, 2006: 80).

Lastly, an overarching problem with prior research into *Person* has been the reliance on experiments and Likert-type scaling which can provide only one lens on, or one manifestation of, attitude or opinion.

Suggestions for Future Research—Application of *Person* Variable as a Determinant of JDM to Financial Accounting

All but one of the studies reviewed under the *Person* variable have been undertaken in the auditing context. The findings have then been applied to the field of accounting in general. However, due to the differences in the nature of auditing and accounting tasks, as shown in third section, what has been found in the auditing context may not always hold in the financial accounting context.

The studies reviewed under knowledge as a person variable have examined the effects of knowledge on JDM in auditing tasks and have shown that knowledge has a positive effect on JDM. According to Bonner (2008: 56), individuals not only need a substantial amount of knowledge, they also need different types of knowledge to achieve high quality JDM. In the psychology literature, knowledge is classified as episodic versus semantic (Klatzky, 1980). Episodic knowledge is linked to personal experiences, while semantic knowledge is more related to understanding the meanings of concepts and principles and is further divided into declarative and procedural knowledge. Declarative knowledge is “knowledge of facts or knowledge that answers the question of what” while procedural knowledge “addresses the question of how” (Roberts and Ashton, 2003: 22).

According to Bonner and Lewis (1990), different types of knowledge relate to judgment, depending on the type of task involved. Knowing that accountants'

tasks differ from auditors' tasks, it is likely that the type of knowledge required by accountants will also differ. Based on the types of tasks performed by auditors, it is likely that auditors will require procedural knowledge of "how the accounting task was undertaken by the accountants," whereas the accountants will require declarative knowledge of "what to do with the given accounting task." However, to date, researchers in the area of auditing have not differentiated between the declarative and procedural knowledge requirements of auditors and therefore future research could seek to differentiate between the declarative and procedural knowledge requirements of accountants. One particularly important type of knowledge that could be examined in future research is the declarative type of semantic knowledge where researchers can measure the knowledge content with recognition tasks, using accountants as subjects. Researchers could derive measures of declarative knowledge by counting the number of items of relevant information in business transactions (Herz and Schultz, 1999). Additionally, no studies have been undertaken to examine the knowledge effects for regulators, so this could be another area for future exploration, that is, to discover the types of knowledge relevant for their JDM. Yet another issue would be to investigate why, despite having a great deal of knowledge, JDM is still of relatively low quality (Nelson and Tan, 2005). For example, investment managers, despite being highly knowledgeable, at times make wrong investment decisions.

The expertise literature also shows that research has been highly concentrated in the auditing context. These findings generally show that experts have better knowledge structures and, as a result, the quality of JDM is improved, especially when the tasks are complex. Because knowledge structures play a prominent role in the quality of JDM, and because there are different types of knowledge structures, such as declarative and procedural, there is a need for further research using accountants as subjects (Roberts and Ashton, 2003). A topic of particular interest would be the impact on JDM of different types of knowledge structures whereby accountants had to apply different methods, such as conventional costing versus activity-based accounting, or different measurement methods; if they were unable to make high quality JDM, it would be necessary to understand how to help them to achieve this. By applying both the declarative and procedural knowledge, for example, accountants could respond to questions such as "what" would be the best measurement technique to use and "how" useful would the information be in reaching a decision (Bonner and Lewis, 1990). The study of Bedard and Biggs (1991) clearly shows that domain specific knowledge rather than general knowledge based on number of years of experience should be used as a surrogate for experience, hence future studies should take this into consideration in the design of research methods.

In the 1980s and early 1990s, there was considerable focus on whether auditors were cognitively limited and susceptible to the heuristics and bias described in the psychology literature, especially those identified by Tversky and Kahneman (1974) (e.g., anchoring and adjustment). An interesting extension of this in relation to information processing would be to study the hindsight versus foresight bias. The hind-

sightful individual possesses outcome knowledge and there is more support for this outcome regardless of its accuracy, whereas the foresightful individual has no outcome knowledge (Fischhoff, 1975: 288). It is expected that, because of the differences in the types of tasks performed by auditors and accountants, there will be differences in JDM between accountants and auditors. It is expected that accountants will be more foresightful individuals because they work on accounting data and produce information, while auditors will be more hindsightful individuals because they justify the work of accountants. Hence, research on hindsight versus foresight bias will help to understand the behavior of accountants and auditors in the area of JDM. Another interesting future research area would be to understand the application of accountants' knowledge of problem representation when processing information as they deal with unstructured tasks for which it is not easy to find a solution.

The use of decision aids is another person variable that has also attracted much research in the auditing context. Decision aids are seen as the external mechanism designed to assist auditors to improve their performance. According to Bonner (2008), providing counterexplanations, that is, reasons why the judgments and decisions made could be incorrect, is also seen as a type of decision aid. Providing counterexplanation is perceived as being effective in improving both cognitive processing (Lord, Lepper, and Preston, 1984; Hirt and Markman, 1995) and problem representation. Thus, uncovering the effects on accountants of counterexplanations of JDM while interpreting and applying the accounting standards could be another important avenue for future research. By providing counterexplanations, accountants would be more confident in their judgments. Another potential area of interest could be an investigation of which types of decision aids could assist accountants in the application of the principles-based accounting standards, since users of these accounting standards generally find the standards complex to understand and apply.

One way of extending Ng and Tan's (2003) study would be to use more revenue-recognition cases, with or without authoritative guidance, to find out what effect guidance has on a judgment. Reflecting on Lehmann and Norman (2006), future studies should use more than one case to generalize the results. Similarly, Butler's (1985) study could also be extended by using a larger sample.

It is clear that there are a number of opportunities for important, interesting, and practical research in the area of financial accounting on JDM using person variables. Specifically, along with the current psychology literature, researchers need to understand what has been found in the auditing context to date, and why the variables of interest might not act in the same way for accountants.

STUDIES THAT CLASSIFY THE JUDGMENT AND DECISION-MAKING FACTOR AS A TASK VARIABLE

“A task is a piece of work assigned to or demanded of someone and task variables relate to dimensions of the task per se” (Bonner, 1999: 390), for example, its

presentation format, complexity and risk. Accountants “perform a variety of tasks to arrive at an opinion pertaining to the financial statements” (Nelson and Tan, 2005: 42). Several studies have examined how JDM is affected when information is presented in different formats, when information is complex, and when there is risk associated with processing the information.

Presentation Format

Information presentation formats make a difference in some situations but not in others (Bonner, 1999: 90). Graphical formats for information presentation have been promoted as an aid to decision making (Kaplan, 1988: 90). Benson (1984: 46) also argues that “information can be absorbed and understood much faster in graphic rather than numeric form.”

Adding to the literature on information presentation formats, Blocher, Moffie, and Zmud (1986) examined the effect of report format (graphic and tabular) and task complexity on the accuracy and bias of internal auditors’ risk judgments.⁴ The findings showed a significant interaction between report format and task complexity, for both decision accuracy and bias. The findings illustrate that for simple tasks, the graphic presentation format helps to distinguish between high- and low-risk states but when tasks are complex the tabular format assists in distinguishing between high- and low-risk states. Kaplan (1988) added to the literature by showing that presentation format did not significantly influence auditors’ judgment on the accuracy of assessing expected sales dollars. This study highlights that auditors can select either a tabular or graphical presentation format without fear of affecting their judgment. This may give comfort to an auditor who has a strong preference for one format over another.

Using an experiment on 40 auditors at five different levels of expertise, Boritz (1985) examined the effect of data structuring techniques on audit judgments by comparing responses based on information cues arranged according to a hierarchically structured template, with the responses to identical cues arranged in a simple list. The structure of information presentation played a significant role in the evaluations and plans of the auditors, but was considered to contribute substantially to the difficulty of making judgments. In most cases, structure appears to contribute to uniformity of responses, but in some instances it actually seems to exaggerate differences in auditors’ judgments.

Other studies have examined the effect of information placements in the financial reports on JDM. For example, using an experiment on analysts, Harper, Mister, and Strawser (1987) showed that students and loan officers prefer to include pension liability in their calculation of debt–equity ratio when it appears in the balance sheet and footnotes, rather than only in the footnotes. Using equity analysts, Hirst and Hopkins (1998) examined experimentally whether the provision of easily

4. Accuracy is “measured as the ability to discriminate between high and low risk reports, while bias is the propensity to report observing a high risk report” (Blocher et al., 1986: 457).

accessible information in the financial statements would permit users to detect earnings management. They found that appropriate placement of the gains or losses for available-for-sale securities in the financial statements enhanced the user's ability to detect earnings management. The findings showed that when the unrealized gains on sales were reported within the reconciliation of comprehensive income and net income, the valuation of the firm was adjusted for the earnings management activity. However, when the unrealized gains were reported in the Statement of Changes in Equity, the stock valuation of a firm with earnings management was significantly higher than that of a firm without earnings management. Using nonprofessional investors, Maines and McDaniel (2000) examined whether and how alternative presentation formats affect nonprofessional investors' processing of comprehensive-income information. They claimed that information placement can signal the relevance of information, with information that is recognized in a performance statement being more valuable than the information recognized in a nonperformance statement.

Using an experiment, Maines, McDaniel, and Harris (1997) reported that analysts view segment reporting as more reliable when it is congruent with internal segment classifications and also when firms group similar products rather than dissimilar products. The study by Libby, Tan, and Hunton (2006) examined how the form of management's earnings guidance affects analysts' earnings forecasts. Using two experiments on analysts, Libby et al. (2006) showed that the form of guidance has no effect on analysts' forecasts made immediately after the earnings guidance is issued, but that forecasts made following the actual earnings announcement are affected by the form of guidance the analysts are provided with.

The findings from the above studies imply that there is no particular information presentation format that is superior in all contexts. The suitability of the presentation formats generally depends upon the information needs of the decision makers. Furthermore, it needs to be considered that some presentation formats are better than others if we want optimal processing of information.

Task Complexity

Given that accounting and auditing tasks differ in terms of complexity, studies that examine the effects of task complexity offer opportunities to understand how task structure can influence judgments. Bonner (1994) provided three reasons for the examination of task complexity in an audit situation: firstly, the complexity of a task will have a considerable impact on auditor performance; secondly, current decision aids and training techniques may be enhanced when researchers have a better knowledge of task complexity; and thirdly, understanding the complexity of a task makes it easier for management in audit firms to use appropriate professionals for different types of audit tasks.

Prawitt (1995) used an experiment to investigate how structured audit approaches affect managers' human resource assignments in environments that vary

in complexity. The findings indicate that the structure of a particular audit approach at the task level affects the experience level required of personnel undertaking the lower and higher complexity level tasks. An addition to the task complexity literature was based on psychological and marketing theories, suggesting that females might make more accurate decisions than males when tasks are complex. Chung and Monroe (2001) examined the effects of gender and task complexity on the accuracy of audit judgments and their findings illustrated that when tasks were less complex, males made more accurate decisions than females, but when the tasks were more complex, females made more accurate decisions. The participants in the study were relatively inexperienced, so the results could not be generalized.

Tan, Ng, and Mak (2002), in an experiment using the data collected by Tan and Kao (1999), examined the moderating roles of both accountability and knowledge on the relation between task complexity and auditors' performance. The results of the study indicate that accountability and knowledge used as a proxy for skills jointly moderate the relation between task complexity and performance.

Risk

Kadous and Magro (2001) found that tax professionals process information according to clients' risk levels. Tax professionals give more consideration to negative outcome information when assessing high-risk clients. The literature on practice risk expanded when Kadous, Magro, and Spilker (2008) investigated whether high practice risk (i.e., exposure to the monetary and nonmonetary costs of making inappropriate recommendations) moderates client preference risk effects. They found that professionals make judgments that are consistent with client preference for low practice risk. They also found that after controlling for the impact of information search, professionals tend to adjust their recommendations away from the client-preferred position, regardless of practice risk. This study contributes to the accounting literature by showing that professionals are able to overcome confirmation bias in high-risk situations by adapting to high-risk settings and conducting a more balanced search for information (Kadous et al., 2008).

Related to practice risk is the condition that affects judgments when dealing with risks. Phillips (1999) shows that auditors pay more attention to aggressive reporting in a financial statement account when it is assessed as having a high, rather than low, risk of misstatement. This study adds to the literature on earnings management and aggressive financial reporting by showing that the amount of attention given to evidence of aggressive reporting for one financial statement account depends on whether aggressive reporting is noted for other accounts. Further, these results indicate that auditors' attention to aggressive financial reporting can be enhanced if auditors prioritize their reviews to examine corroborating evidence for high-risk accounts before they consider evidence documented in low-risk accounts. These results have direct implications for scheduling audit work and may extend to other financial statement users.

Understanding the client acceptance process is crucial because client acceptance decisions are critical to the success of public accounting firms. Firms are interested in obtaining and retaining clients but do not wish to be associated with overly risky clients. Ayers and Kaplan (1998) took a further step by investigating whether risk review partners make more conservative client acceptance judgments than engagement partners, and if so, why they do. Their results suggest that risk review partners make more conservative client acceptance judgments than engagement partners. The findings show that factors such as individual differences, firm incentive/disincentive schemes, and client-specific factors affect client acceptance judgments. The findings also show that risk review partners, having their different experiences and perceptions, are more conservative about the client acceptance decision process. The study yields important insights because it shows how two types of partners differ in their views of client acceptance.

Audit risk is also an important JDM variable that has attracted much attention from researchers. For example, Pratt and Stice (1994), in a field experiment using audit partners and managers, examined whether auditor judgments of litigation risk and their recommendations for the preliminary audit plans and fees were influenced by certain client characteristics such as financial condition, asset structure, and sales growth. The findings show that the overall financial condition of the client is the key consideration in the litigation assessment and recommendation process for audit plans and fees. The findings also show that the auditor assessment of a client's overall litigation risk is the major factor in deciding the audit fee. Goodwin and Trotman (1995) subsequently undertook an experimental study which examined the audit of devalued property assets and considered two conflicting risk situations that exist concurrently in auditing: (1) the threat of litigation and (2) the threat of losing a client. The findings show that there is a strong interaction between the threat of litigation and the threat of losing a client; auditors planned to spend significantly more time on the audit of revalued assets when the risk of breaching a debt covenant was high and there was little danger of losing the client. Goodwin and Trotman's study identified several important factors that affect the audit judgment of revalued assets, which has implications for the audit process.

A number of studies have been published on litigation risk in the journal *Auditing, A Journal of Practice and Theory*. In auditing, the auditor must assume the risk of an uncertain rate of return from an engagement because the audited financial statements can contain hidden material misstatements which may be revealed after an audit report has been issued. Such ex post exposures regarding incorrect audits may lead to accusations of negligence against the auditor resulting in expensive litigation and/or the loss of reputation. Therefore, the fees that auditors should charge their clients should cover such uncertainties in audit. Simunic and Stein (1996) investigated the relationship between audit pricing and litigation risk, examining whether audit fees are sufficient to compensate for the litigation risk. This knowledge is crucial for an understanding of the types of crises audit firms face. Based on analysis of 249 audits carried out by a Big 6 auditor, the study shows that the audit fee is linked to the litigation risk. Houston, Peters, and

Pratt (2005) subsequently expanded the audit fee model by adding a third factor, nonlitigation risk, reflecting general business risks, and/or opportunities that lie beyond litigation risk or the conduct of the audit. In an experiment, the audit partners and managers were asked to assess various risks and develop an audit plan after reviewing one of four risk-increasing audit scenarios: (1) the discovery of an error, (2) the discovery of a GAAP inconsistency, (3) a client buyout in which the audited financial statements were used to determine the exchange price, and (4) the loss of a major client customer. They found that in the error and buyout cases, audit fee increases were explained only by the planned increase in audit investment; in the GAAP inconsistency case, the audit fee increase was explained in part by the planned increase in audit investment, but to a greater extent by the residual litigation risk; in the loss of customer case, the audit fee increase was explained by the planned audit investment, residual litigation risk, and nonlitigation risk.

With the ongoing interest in the field of litigation, Abbott, Parker, and Peters (2006) examined the association between audit fees and earnings management, using publicly available fee data. They hypothesized that, due to asymmetric litigation effects, audit fees decrease (increase) with a client's risk of income-decreasing (increasing) earnings management risk. They also hypothesized that the positive relation between income-increasing earnings management risk and audit fees is heightened for clients that are high-growth firms. They found that downward earnings management risk, as estimated by negative (i.e., income-decreasing) discretionary accruals, is associated with lower audit fees, while the upward earnings management risk, as estimated by positive discretionary accruals, is associated with higher audit fees. Casterella, Jensen, and Knechel (2010) examined the association between audit firm characteristics and audit firm litigation risk, which had not previously been researched. By using data from a large insurance company, they examined the link between several audit firm characteristics and audit-related litigation. The findings showed that larger firms, firms experiencing rapid growth, firms that sue their clients, and firms with a history of problems all face greater litigation risk. It can be clearly observed from the research undertaken on litigation that even though auditors sign the financial reports as true and fair, there is always the fear of hidden material misstatements in the financial reports.

Research Methods

In this review, the use of a Likert-type scale has been common in most of the studies. All the papers under review have used experiments except for three studies conducted on the subject of litigation risk (Simunic and Stein, 1996; Abbott et al., 2006; Casterella et al., 2010). Studies undertaken using experiments had a number of limitations with the design of their experiment. For example, Prawitt (1995) used an experiment on managers to investigate how structured audit approaches affect managers' human resource assignments in environments that vary in complexity. Limitations to the results of this study include the fact that the nature and scope of the experiment did not allow for complete researcher control at all phases

of the data collection, and that the generalizations about practice were limited by the assumption that responses realistically reflected human resource allocation decisions in practice. In their examination of whether high practice risk mitigates the client preference effect, Kadous et al. (2008) conducted a study that was potentially limited because perceptions of risk and corresponding effect are inextricably linked (e.g., Johnson and Tversky, 1983; Slovic and Peters, 2006), thus it is possible that in manipulating practice risk, the effect on the client is also manipulated.

Additionally, the results of Phillips's (1999) study may not be generalizable because the experimental design required subjects to review pieces of evidence in an environment that did not allow them to search freely for other evidence, although that would be possible in a realistic setting. One of the major limitations of the Houston et al. (2005) study is that the data were gathered before the Sarbanes-Oxley Act (SOX), therefore the study's result might not hold post SOX where litigation risk is crucial: "the close scrutiny of auditors makes the reputation dimension of nonlitigation risk more salient (for auditors of both public and private companies)" (Houston et al., 2005: 52). Further, for studies on the subject of litigation, there have been concerns regarding data sampling risks that would hinder the generalizability of the results.

Suggestions for Future Research—Application of *Task* Variable as a Factor of JDM to Financial Accounting

The research on *Task* variables demonstrates that factors such as (1) presentation format, (2) task complexity, and (3) risk affect the JDM of individuals. Most of the research was undertaken in the auditing context. While these studies provide evidence of the effect of task variable factors on JDM, there is still scope to expand the current literature in the context of financial accounting.

With regards to the presentation format, that is, how information is provided to the user, mixed findings were reported in the studies reviewed. In the audit research, one of two studies examined shows that presentation format influences auditors' judgments (Blocher et al., 1986), while the other indicates that it does not (Kaplan, 1988). The study by Maines and McDaniel (2000) suggests that the placement of information in the financial reports influences the judgments of individuals. A crucial role of accountants is to prepare financial reports in which judgments and decisions for users are required that pertain to the amount and type of information to be disclosed. Since accounting attaches numbers to many items (Kadous et al., 2005), with few items being described qualitatively, it is crucial that the aggregation of items be correct so that an accurate picture of the organization is conveyed to users.

Future research could examine how accountants could clearly identify the components of the presentation format that influences the judgments and decisions of users. For example, contingent liabilities are currently disclosed as notes in financial reports; however, Maines and McDaniel (2000) showed that

information placed on the face of major financial reports is most important. Hence, standard setters should carry out research on the relevance of contingent liabilities disclosure to substantiate whether it is appropriate. Additionally, accounting dictates how numerical items are to be presented (e.g., in which categories they are to be placed and where they will appear in the report) (Bonner, 2008: 159), and the role of standard setters and regulators therefore becomes critical. Empirical research that illuminates the significance of where information is placed in the annual reports can be of practical importance. Furthermore, applying the findings of Libby et al. (2006) also points to future studies which could consider the forms of additional guidance that could be provided to assist report preparers to improve their JDM in their interpretation of IFRS.

Of additional importance is the fact that users of accounting information regularly search the Internet for updated information and according to Rieh (2002), Web users make judgments based on information quality when searching for information. According to Taylor (1986), the values of information quality are accuracy, comprehensiveness, currency, reliability, and validity. Consequently, future research could access information users to investigate what types of information are considered to be accurate, comprehensive, current, reliable, and valid for informed decisions.

Findings from prior research have also shown that, on average, task complexity has a negative effect on judgments and decision making. Research on complexity in accounting is more relevant than ever, particularly in the context of IFRS, which users often find challenging to apply. Future research could investigate the effects of complexity in IFRS on the accuracy of financial reporting. Kachelmeier and Messier (1990) found that a decision aid increases decision accuracy when complex tasks are undertaken; thus, an interesting research topic would be to ascertain the best decision aid to assist users of IFRS and improve their judgments and decisions. Moreover, researchers should continue to investigate whether reactions to task complexities by users of accounting information can harm those users' JDM (Bonner, 2008: 167). For example, "if managers respond to rules-based standards by reinterpreting evidence so that it is consistent with the standards, investors may be harmed if they assume that the rules prevent managers from behaving in this manner" (Bonner, 2008: 167).

Given that most accounting tasks involve decisions under uncertainty, risk as a task factor is extremely relevant. Surprisingly, however, there is little research in accounting which examines the effects of risk on JDM. Research has generally shown that people are risk-averse, so it would be interesting to examine how the risk-averse behavior of managers affects their choice of investment projects and thereby the effect of those choices on an organization's earnings. It is important to understand the various factors among alternative investment decisions and how these factors affect JDM, particularly those that may appear to be responsible for earnings losses, because such an understanding will improve the quality of JDM among risk-averse individuals.

IFRS, being complex to understand, can also cause difficulties in the evaluation of risks by users of accounting information. An understanding of how risk disclosures are likely to be interpreted by users is important because risk disclosures are not always interpreted as intended (Slovic, 1987). An interesting future research would be to examine users' risk judgments when IFRS, being principles-based and allowing flexibility in reporting, are used for reporting purposes.

Under IFRS, flexibility in making accounting choices can lead to aggressive reporting. For example, using financial managers as the subjects, Jamal and Tan (2010) found that the aggressive behavior of individuals is contingent on auditors adopting a principles-oriented mindset. This flexibility in accounting choices is likely to impose costs on financial statement users because the report preparers have the freedom to determine the type of information provided. It is important to investigate to what extent regulators understand the advantages and disadvantages of allowing choices and whether they can determine the "optimal" level of discretion for report preparers.

Additionally, it has been observed that auditors are more closely linked to "litigation risk" when they are not able to detect materially incorrect information in the financial statements. Future research should also look into litigation risks where accountants who have prepared financial statements have made inappropriate judgments and disclosed incorrect information in the first place. The litigation risk should not be only borne by the auditors but by the accountants as well.

Reflecting on past research, there are appreciably many possibilities for exciting and essential research in the area of financial accounting using task variables as the factors affecting JDM.

STUDIES THAT CLASSIFY THE JUDGMENT AND DECISION-MAKING FACTOR AS AN ENVIRONMENT VARIABLE

"Environmental variables relate to the conditions and circumstances surrounding an individual while he or she performs a JDM task; they are not related to any one task, for example, an individual can be subjected to time pressure while performing a number of tasks" (Bonner, 1999: 390). The environmental factors do not alter the requirements of the task, rather they change the extent of the effort that decision makers are willing to employ to fulfill those requirements; that is, such variables change the motivation. The literature under review has focused on four areas as being characteristic of the accounting environment: corporate governance and internal control; pressure; group rather than individual decision-making processes; and accountability.

Corporate Governance and Internal Control

"Corporate governance and internal control are an important entity-level factor that sets the tone for the overall control environment and has significant implications

for risk judgments” (Sharma, Boo, and Sharma, 2008: 106). Corporate governance, which is often regarded as the central feature of a firm’s internal control system, affects the extent and timing of undertaking tasks (Fama, 1980; Fama and Jensen, 1983).

In the 2000s, there was a shift in the literature from the perception of corporate governance as something of a monitoring role to an interest in how governance mechanisms, such as the board and audit committee, affect the audit process. DeZoort and Salterio (2001) experimentally investigated whether audit committee members’ corporate governance experience and financial reporting and audit knowledge affected their judgments in auditor–corporate management conflict. Using a sample of 68 audit committee members, the results demonstrated that greater independent director experience and greater audit knowledge was linked with higher audit committee member support for an auditor who advocated a “substance over form” approach when discussing issues with the client’s management. However, when the audit committee member has experience as a board director and is also a part of senior member of management, he provided support to client’s management. This study certainly supports the notion that audit committees be composed completely of independent directors. The results also support auditor concerns that varying knowledge levels lead to systematic differences in audit committee member judgments in disputes between auditors and management.

Cohen, Krishnamoorthy, and Wright (2002) demonstrated that seniors, managers and partners making audit decisions use corporate governance information. They reported that auditors may also rely on the audit committee if they are delegated increased responsibilities over the financial reporting process. Anderson et al. (2004) added to the literature by examining the board of director characteristics that influence the integrity of the financial reporting which have implications on the cost of debt. Using a sample of 500 firms they showed that debt costs are lower for firms with boards dominated by independent directors than by insiders. The analysis showed that creditors are sensitive to board attributes that affect reporting legitimacy. Their study also showed that creditors view the audit committee and their attributes as important elements in decision making. The findings show that cost of debt is lower for firms with fully independent audit committees relative to those who have insiders on the audit committee. Jennings, Pany, and Reckers (2006) showed that by strengthening corporate governance and rotating audit firms, auditor independence is improved. The study by Sharma et al. (2008) extended the literature to include voluntary corporate governance. The results show that when corporate governance is strong, auditors are happy to accept clients because these clients are considered to have lower control environment risk. The findings suggest that the acceptance of audit clients is largely dependent on the client’s level of corporate governance.

In audit planning and corporate governance, an understanding of the strength of a client’s internal controls in various cycles is also important. Wright and Wright (1996) examined the occurrence, financial impact and cause of detected

misstatements as related to the assessed strength of internal controls. The findings suggest that when controls are assessed as being weaker, errors are more likely to affect reported earnings, suggesting greater audit exposure. This was found to have important implications for the appropriate focus of audit tests under different internal control situations, since procedures should be tailored to risks that are present. Consideration of control environment risk factors may serve to further mitigate such risk and enable auditors to avoid conducting costly audit procedures. For example, a management with strong knowledge of accounting and a willingness to consult with the auditors may substantially reduce the frequency of errors.

Pressure

Alderman and Deitrick (1982) examined auditors' perceptions of time-budget pressures and premature sign-offs. Prior research clearly establishes that although there are many advantages of time budgets, undue emphasis on meeting the programmed time may have detrimental effect on the organization as well as the profession. Using a survey on audit personnel they confirmed that time-budget pressure is considered to be one of the biggest factor affecting the quality of auditor work. The study also showed that the time-budget pressure and premature sign-offs are more common in big organizations. These findings are surely of a great concern for the audit work where the supervisors need to carefully establish what is a reasonable time parameter to undertake the required audit tasks carefully.

Kelley and Margheim (1990) extended this line of research where using a survey they examined the impact of time-budget pressure on dysfunctional auditor behavior and also examined how several characteristics of audit team members might moderate the dysfunctional effects of time-budget pressure. The characteristics examined included the leadership style of the senior auditor and staff auditors' personality types. The descriptive results of this study showed a shocking number of instances of poor quality audit work in practice. Over 50 percent of the auditors denoted (1) "prematurely signing-off on audit program steps," (2) "reducing work performed below what the auditor would consider reasonable," (3) "failing to research an accounting principle," (4) "making superficial reviews of client documents," and/or (5) "accepting weak client explanations" (Kelley and Margheim, 1990: 40). The results indicated that underreporting was a usual behavior when time budgets were perceived by auditors to be "very tight, practically unattainable" (Kelley and Margheim, 1990: 34) or when senior auditors had very strong Type A personality traits, that is, auditors with these traits exhibited more job related stress than auditors without significant Type A personality traits. This study also has important implications for the profession as well as for standard setters. The profession needs to establish preventive measures to minimize poor quality audit work resulting from time pressure, and standard setters should place appropriate emphasis on the possibility of dysfunctional behavior when they are developing professional standards.

Bamber and Bylinksi (1987) examined how audit managers budget their time between different audit responsibilities. In particular, they considered how much time is allocated to planning and how much is allocated to review. Their results suggest that a manager's review is not performed as a simple mechanical process, but is an appropriate response to the characteristics of the engagement. The findings show that time pressure does not influence the quality of a manager's review. Lee (2002) adds to the literature on the professional socialization of auditors. He found that although time pressures exist, junior staff often sacrifice leisure and study time to ensure the proper conduct of audit work. Junior staff members' regular responsibilities in the context of risk-based auditing involve the use of discretion when deciding how to use the time available to obtain the best possible evidence to reduce the risk of a material misstatement.

Auditing creates an environment in which time pressure and program structure are jointly imposed, and McDaniel's (1990) research shows the interactions between these two environmental factors. His study demonstrates the importance of examining more than one environmental factor at a time. McDaniel assessed whether and how the imposition of time pressure and structured guidance affected audit performance. The results suggest that increasing time pressure reduces audit effectiveness. The empirical results indicate that auditors' "processing accuracy and sampling adequacy, as well as overall audit effectiveness, declined as time pressure increased" (McDaniel, 1990: 282). By contrast, audit efficiency increased with increasing time pressure. McDaniel suggested that structure and too much time pressure could lead to stress, which could reduce a subject's motivation to perform the task well.

DeZoort and Lord (1994) extended the time pressure literature to include obedience pressure. The findings indicate that obedience pressure within a public accounting firm can affect subordinates' judgments, which can lead to variations in auditor judgment and an increased likelihood of auditors violating professional norms and standards. These findings have practical implications, such as the need to devote additional time within the firm to training programs that focus on the resolution of conflict between personnel to reduce the effects of obedience pressure. Written guidelines should be in place for application when there are disagreements between auditors. Dunk (2007) added to the literature by studying innovation budget pressure and found that the quality of information systems has a positive influence on performance when innovation budget pressure is high, but that it has no effect when pressure is low.

Houston (1999) used an experiment to examine the joint effects of fee pressure and client risks on the time-budget decisions of audit seniors. The findings showed that audit seniors' are less responsive to increased risk in the presence of fee pressure. The findings also showed that in the presence of client risk, seniors planned fewer audit procedures when fee pressure was present. These findings are not consistent with a normative audit risk model, because the audit seniors are influenced by the fee pressure. This is clearly of concern to audit

partners and managers, who need to carefully review the time-budget planning of audit seniors.

Moreno and Bhattacharjee (2003) looked at pressure from another perspective when they examined the impact of pressure to obtain potential client business opportunities on the auditor judgments. Because the market for auditing has become quite competitive over time, the provision of some form of incentive for additional services by the client may put pressure on an auditor's judgment with respect to the support of client reporting. Using an experiment on low-ranked auditors (staff and seniors) and high-ranked auditors (managers and partners), it was found that when low-ranked auditors were provided with information concerning a client's additional business opportunities, their audit judgments favored the client, but the audit judgments of high-ranked auditors were not affected by these additional client business opportunities; rather, the high-ranked auditors were concerned about litigation risk. Hence, this study shows that low-ranked auditors are influenced by offers of additional business opportunities, which can lead to litigation risks for audit firms and thus has implications for the audit practice. The development of effective training could help to minimize the influence on low-ranked auditors of increased business opportunities from clients. Accounting education could help auditing students to understand how additional services offered by clients as incentives might also lead to litigation risks for the clients.

Group as Opposed to Individual Information Processing

Relatively little work has been carried out on the differences in the judgment of information processing carried out by groups and conducted individually. Solomon (1987) observed that the results of existing studies were contradictory, and Libby and Luft (1993) pointed out that the reasons for group performance exceeding individual performance were unclear.

Trotman and Yetton (1985) were the first to investigate the mechanisms by which differently structured groups could reduce judgment error. They found that the review process significantly reduced judgment variance. However, similar improvements were obtained by the use of an interacting or composite group of two seniors. Stocks and Harrell's (1995) study extended individual versus group information processing, which had important practical implications. The results indicate that groups make better judgments than individuals when undertaking complex tasks.

Johnson (1994) conducted an experimental study which assessed whether auditor memory performance, that is, auditors' ability to recall previously encountered evidence, is better when individuals work in a group. Prior research shows that individual auditors commonly make errors when recalling items about previously viewed audit evidence and are overconfident in their inaccurate memory of audit evidence. The findings showed that auditors working in a group recalled more

items about previously viewed audit evidence and were more accurate in their recall than auditors working individually.

These findings imply that decisions related to complex business matters should be made by groups rather than individuals.

Accountability

Another characteristic of accounting settings that has attracted the attention of behavioral researchers is the fact that individuals responsible for making decisions are also accountable for their decisions to many stakeholders such as supervisors, clients, or others. Accountability can motivate individuals to exert more effort while undertaking tasks because the decisions they make can affect their performance evaluation and, ultimately, monetary reward. Accountability can also induce increased effort to demonstrate competence levels (Libby and Luft, 1993). Understanding the determinants of accountability is important, because accountability can be used by CPA firms to influence auditors' performance through review and performance evaluation processes.

Ashton (1990) was one of the first to highlight the performance effects of accountability. His study shows that the directional effects of three pressure inducers (incentives, feedback, and justification) are moderated by the presence of a decision aid. It also shows that in the absence of a decision aid, subjects achieved greater classification accuracy in a repetitive decision task when a monetary incentive was offered, or when feedback about past performance was provided, or when they were required to justify their choices, relative to the absence of these three variables. By contrast, when a decision aid was available, the same incentive, feedback, and justification requirements resulted in lower classification accuracy, again relative to the absence of these three variables. The subjects in Ashton's study did not have the requisite task-specific knowledge, which could be one reason why the justification pressure encouraged subjects to reduce their reliance on the decision aid and increase reliance on their own judgment. Unfortunately, because they did not have the relevant knowledge for the task, performance suffered.

Relevant to Ashton's (1990) study, Tan and Kao (1999) examined how the relation between accountability and performance could be moderated by task complexity, knowledge, and problem-solving ability. They provided evidence that accountability might not improve performance for low and medium complexity tasks where the individual lacks the requisite knowledge, or for high-complexity tasks where the individual lacks either the requisite knowledge or problem-solving ability. The implication of these findings is that accountability may lead to increased effort but does not necessarily improve performance. In such instances, it may be more helpful to introduce decision aids, replace the auditor with someone who has the requisite knowledge and ability, and reassign the auditor to a task that matches his or her skill level.

Johnson and Kaplan (1991) undertook a study on auditors' accountability. An experiment was undertaken where the auditors completed an inventory task in which they assessed the risk of obsolescence for 20 inventory items. The findings of the study showed that the accountable auditors displayed higher consensus and self-insight than the unaccountable auditors. According to Johnson and Kaplan, the absence of relevant environmental factors from the experimental setting limits the understanding of auditor judgment. The study emphasized the importance of motivation induced by the naturally occurring elements in the auditor's decision environment which might mitigate the limitations in auditor judgments.

Glover (1997) addressed a related issue, examining whether auditors exhibit a dilution effect when faced with time pressure and accountability.⁵ He found that time pressure reduced the dilution effect. Contrary to the findings in psychology, accountability did not influence the dilution effect exhibited by auditors. While previous studies have focused primarily on the detrimental effects of time pressure on judgment effectiveness, this study provides evidence that time pressure, even at a relatively high level, can reduce judgmental bias.

Accountability may not solve all bias and performance deficiencies, which is why it is important to find out under what conditions accountability does or does not work. Kennedy (1993, 1995) looked at the conditions under which accountability operates and conducted studies to show when judgment bias could be reduced with increased accountability. Kennedy's (1993) study shows that accountability helps in the audit review process and also leads to increased effort being exerted by individuals in a variety of ways. The study examined whether accountability, defined as the requirement to justify one's judgments to others (Tetlock, 1983), mitigates recency.⁶ Her findings show that executive Master of Business Administration (MBA) subjects, who were not familiar with making judgments about going-concern firms, displayed significant recency effects, while auditors, who were familiar with this task, did not demonstrate recency effects. However, when accountability was imposed on the MBA subjects, no recency effects were noted. The study shows that effort-related bias such as recency can be mitigated by accountability. This study has implications for auditing practice and audit judgment research because auditors always operate in an accountability-inducing environment. Audit managers make going-concern evaluations of their clients based on many pieces of evidence that have been gathered and reviewed, and their own judgments are subject to review. The absence of recency found in the study when judgments were made by experienced professionals after all the evidence was available, and the debiasing effect of accountability for less experienced judges, suggest that recency may not be an issue of great concern for audit practitioners.

5. The dilution effect is when judgments are negatively affected by the presence of irrelevant information, leading to poor judgments.

6. Recency relates to the tendency to overweight evidence received later in a sequence.

The study by Kennedy (1995) added accountability to the knowledge literature, which also had important practical implications. The study examined the “curse of knowledge”⁷ in judgment and the extent to which it is mitigated by accountability, experience, and counterexplanations. In experiments using both the going-concern and analytical review type tasks, Kennedy established that the curse of knowledge effect is found among auditors and MBA students. The study shows that accountability is ineffective in mitigating these effects. The practical implications of Kennedy’s findings are quite important; for example, in cases of fraudulent reporting or lawsuits alleging negligence by auditors, it is common for other auditors to be called upon to review the audit papers and comment on the quality of the audit provided.

Applying the social contingency theory in which individuals are motivated by a desire for the approval of others, Tan, Jubb, and Houghton (1997) extended Kennedy’s (1995) work by examining whether accountable auditors align their views with those expressed by their superiors. The results indicate that risk assessments made by a partner and known by a subordinate have a significant influence on the risk assessments made by accountable subordinates. Additionally, when subordinate accountable auditors are exposed to the preferences of the superior to whom they are answerable, they generally engage in less cognitive processing than subordinates who are not as accountable.

Gibbins and Newton (1994) extended the literature to expand the conceptual base of accountability by placing it in the professional setting of the public accounting firm. They used self-reports of accountants in public accounting firms to incorporate some of the contextual factors associated with accountability in that setting. The results indicate that reported accountability situations lead to increased cognitive effort, and through these changes in cognitive processing, accountability seems to reduce the occurrence of judgmental bias.

Based on a cognitive model of justification, Peecher (1996) carried out an experiment to examine whether the preferences of those demanding justification (justifiee preferences) affect the weight that auditors give to different levels of an environmental cue (e.g., client integrity). This was the first study to provide evidence that the preferences of the reviewer are significant. The findings suggest that justifiee preferences influence auditors’ likelihood assessments and the weight they attach to positive levels of environmental cues when making such assessments. However, the findings also suggest that negative levels of environmental cues diminish the influence of justifiee preferences. This study raises questions about the ability of auditors to disentangle the justification enhancement value of evidence from other properties. Wilks (2002) extended this work by providing evidence that the reviewer’s preferences distort the preparer’s memory for evidence. He shows that when the individuals providing judgments know the expectations of their clients, the judgments are biased toward the client’s preferences.

7. The curse of knowledge occurs when individuals are unable to disregard inappropriate information that has already been processed (Kennedy, 1995: 249).

Hoffman and Patton (1997) investigated the effects on auditors' judgments of being held accountable to superiors in the firm. The specific audit judgment task studied was fraud risk assessment in the presence of both relevant and irrelevant information. Their results show that auditors' judgments exhibited a dilution effect both when they were held accountable and when they were not. Accountability to superiors did not exacerbate the dilution effect but did result in more conservative fraud risk judgments. The results of this study have important practical implications, because senior auditors in the real world encounter a great deal of irrelevant information. Thus, it is likely that their fraud judgments are also biased by the dilution effect, although there are ways to mitigate these effects. For example, a review by a manager or partner could influence the firm's ultimate fraud judgments. If the managers' and partners' fraud judgments are not influenced by the dilution effect, they may be able to offset any bias in the judgments of seniors.

Libby, Salterio, and Webb (2004) examined whether the quality of balanced scorecard measures improves when managers held accountable need to justify their decisions to their superiors. They found that when managers have to justify their judgments, there is increased managerial use of unique measures. The results suggest that auditing and assurance regulators, standard setters, and public accounting firms and their clients may wish to continue to examine the nature and value of assurance reports in the area of performance measurement. DeZoort, Harrison, and Taylor (2006) investigated the effect of differential accountability pressure strength on auditors' materiality judgments. They found that when auditors experienced high accountability pressure, their materiality judgment was more conservative and had less judgment variation than when accountability pressure was lower. Additionally, they found that auditors under high levels of accountability pressure needed more time to complete the task. These findings suggest that when individuals are more accountable, they require more time to carry out the task and need to be more careful in carrying out their responsibilities.

Adding to the accountability literature, Bagley (2010) studied the effect of accountability on multiple parties. Bagley conducted an experiment to examine how varying levels of accountability and task complexity influence negative affect, that is, negative emotional responses such as frustration, anger, and anxiety which are likely to affect task performance. One hundred and thirty-six auditors took part in three accountability conditions, namely no accountability, single accountability, or multiple accountabilities, when completing both a low-complexity and high-complexity audit task. The findings show that auditors who were confronted with multiple accountabilities experienced significantly more negative affect than auditors in single accountability or no accountability situations. The findings also show that auditors who were accountable to multiple parties and undertook complex tasks experienced a high level of negative affect; in addition, this high level of negative effect harmed performance when the auditors were working with low-complexity tasks. These findings are of great concern for both

accountants and auditors, because there are multiple accountabilities in real life; hence it is important that precautions should be undertaken when allocating tasks to accountants and auditors for which they are accountable.

Research Method

All the studies reviewed, with the exception of five, used the experimental method to study the factors grouped under *Environment* that affect JDM. The Stocks and Harrell (1995) study used a survey method, while Anderson et al. (2004) used a sample of 500 firms in their study. Alderman and Deitrick (1982) and Kelley and Margheim (1990) also used a survey method. The Stocks and Harrell (1995) study had certain limitations; even though their research method allowed them to collect the data in a natural setting, it lacked the involvement of the researchers, raising questions about the validity of the responses.

Kennedy (1993) showed that effort-related bias such as recency can be mitigated by accountability and, using an experiment (Kennedy, 1995), examined the “curse of knowledge” in judgment. Both of these studies have limitations because auditors work in environments in which they deal with more information than is provided in the research setting. Additionally, DeZoort and Lord’s (1994) study of obedience pressure does not reflect the practical situation because the pressure to obey a superior is likely to be much greater in practice. Similarly, the DeZoort et al. (2006) study did not reflect real-world situations, because in the real world, auditors are accountable to many stakeholders such as superiors, audit committees, client management, and regulators.

There are also limitations to the Trotman and Yetton (1985) study. Their results may not generalize to natural settings in which auditors have incentives to process information more or less extensively than they did during this experimental task. Care should equally be taken when generalizing from the results of the Glover (1997) study. In practice, auditors work in a more complex environment (e.g., richer information, group decision making, incentives, feedback, supervision, and review) than the experimental setting in the study. Other variables present in the audit environment may interact with time pressure, accountability, and nondiagnostic information, and different levels of these factors can exist in almost any combination. Bagley (2010) has also highlighted that even though the findings of her study are valuable, nevertheless the fact that she was not able to manipulate the multiple accountabilities confronted by auditors in real life warrants further research in the area of multiple accountabilities.

Suggestions for Future Research—Application of *Environment* Variable as a Factor of JDM to Financial Accounting

With the exception of three studies (Dunk, 2007; Stocks and Harrell, 1995; Libby et al., 2004) under the environment variable, the studies are related to auditing JDM under a variety of auditing tasks. While these studies mostly provide evi-

dence of the effect of environment variable factors on JDM in the domain of auditing, there is still scope to expand the current literature in the context of financial accounting.

The findings of the studies reviewed show that effective corporate governance and strong internal control are critical and ubiquitous for enhancing auditor independence and thereby improving JDM. The governance role is also of utmost importance in financial accounting due to agency theory. By having good corporate governance mechanisms, managers are disciplined to act in the investor's best interest. A fundamental objective of good governance is to ensure that accountants provide the most reliable and relevant information to users, and that agency costs are minimized. Hence, one motivation for future research would be to seek insight into the quality of accounting practices when the agency costs are minimized, facilitating the production of reports leading to promising investment opportunities. Further, research has shown that the "independent audit committee" substantially impacts on the cost of debt financing, so future studies could also examine why the "independent audit committee" is such an important element of the financial reporting process.

Studies examining the effects of time pressure on JDM have provided mixed results, that is, showing positive, negative, and nil effect on JDM. Like auditors, accountants also face time and budget pressures. Normally, accountants anticipate the time pressure because they know they have to prepare end-of-year reports within a few days of the relevant month-ending. It is crucial to investigate the effects of time pressure on the quality of reporting by accountants, and if the quality of reporting is thus affected, it becomes crucial to investigate the strategies that firms should adopt to deal with this. The study by Lee (2002) on how junior staff sacrificed their leisure time to meet deadlines could shed light on accountants' responses to time pressure where the quality of the reporting is not negatively affected. It also seems important to understand how accountants deal with unanticipated time pressures that come from other parties such as the government, or environmentalists, to meet deadlines effectively. An understanding of how accountants deal with unanticipated pressures would assist businesses to allocate resources in ways that would minimize the pressure in the workplace. McDaniel (1990) shows the importance of the use of decision aids when auditors are faced with time pressure; future research could be conducted to understand the types of decision aids that could assist accountants when they are faced with such circumstances.

Group JDM is thought to be superior to individual JDM, but this is not always true (Solomon, 1987; Libby and Luft, 1993). This contingency is consistent with the findings in psychology that groups sometimes perform better than individuals and sometimes they do not. In the context of financial accounting, many important decisions, such as embarking on a new project or handling institutional clients, are made in groups, which necessitate a better understanding by researchers of the composition and processes of these groups (Stocks and Harrell, 1995). Once

researchers are able to establish which group attributes are different from those of individuals and assist in the improvement of JDM, these attributes could have practical implications in the workplace.

Future studies could also examine the interaction of the type of group process and the type of task, that is, different types of tasks are assigned to different groups, and it could be expected that one kind of group might perform better at one task, while another group might perform better at another task (Trotman and Yetton, 1985). This may add to the understanding of the way that accounting and auditing tasks are organized, that is, how different types of groups can handle different types of tasks.

Even though accountability is such an important element of the financial accounting environment, it has still not attracted much attention among financial accounting researchers, and the bulk of research has been undertaken in the auditing context. Generally, the findings in auditing and psychology have shown that when an accountable person knows the views of the people to whom they are accountable, their views become biased toward those views (Tetlock, 1985; Peecher, 1996; Lerner and Tetlock, 1999; Turner, 2001). In the financial accounting context, the preparers of reports are accountable to many information users of whose views they are unaware. At the same time, report preparers can presume that some users, such as investors, are looking for reports that show higher earnings, so it is crucial to separate the effects of what is desired by other users from those of the owners of the company. By incorporating the above suggestions in the context of financial accounting, it is conceivable that the JDM of accountants could be improved, thereby improving the quality of the financial reports.

CHOICE OF RESEARCH METHODS

All but 11 of the studies reviewed in this paper have used the experimental method, which establishes the importance of experimental methods in auditing judgment. One of the major strengths of the experimental method is that the researcher creates the setting in which the experiment is carried out, manipulates the independent variable (cause) and finds the effect on the dependent variable (effect). Experiments also have the advantage of testing those variables that do not yet exist in the accounting or auditing environment, such as the effect of a new decision aid or a new accounting standard (Trotman et al., 2011). Moreover, experimental methods facilitate the discovery of the interactive effects of the inter-related factors that coexist in the natural environment by showing the conditional effects based on levels of other factors (Joe, 2003; Ng and Tan, 2007).

Despite the strength of such experimental methods, however, there are several methodological limitations that may jeopardize the internal and external validity of the research results and, consequently, limit their applicability in practice. One of the biggest threats to internal and external validity is sampling. To carry out an

experiment that depicts reality, the researcher is obliged to select a sample that represents the population and to allocate subjects to the various study groups on the basis of randomization (Duffy, 1985; McMahon, 1994; Clifford, 1997). However, if potential participants are not prepared to opt for treatment on a random basis, there will be problems which might limit the generalizability of the results for the wider population (Brewin and Bradley, 1989; Silverman and Altman, 1996). Supporting this claim is the study by Earley (2002) who investigated the impact of experience on client-provided discount rates for real estate valuations. She discovered that it was difficult to determine whether the auditors had the prior knowledge to carry out valuation tasks (and other related analytical tasks). Butler's (1985) study was based on a very small sample size (only seven usable responses in the control group and eleven in the aid group), while the Lehmann and Norman (2006) study also suffered from potential selection bias because the subjects were not chosen randomly.

A further limitation of experimental research is that subjects in an experimental setting may not behave or respond in a natural manner as a result of feeling observed (Haughey, 1994; Clifford, 1997). This limitation is reflected in DeZoort and Lord's (1994) study of obedience pressure, where the pressure in a practical situation to obey a superior is likely to be much greater than in an experimental setting. The fact that the research setting does not represent a natural setting is a common weakness of experimental methods, as shown in DeZoort et al. (2006). Similarly, the Trotman and Yetton (1985) and Glover (1997) studies may also not generalize to natural settings where auditors have incentives to process information more or less extensively than they could in these experimental tasks.

To overcome the limitations of the experimental methods, it would be worthwhile to design an experiment that uses a large sample in which the subjects are randomly chosen and have the attributes of the population under study. Selecting subjects randomly enhances the internal validity of the results. Furthermore, to address the issue of subjects being observed and not behaving in a natural manner, an unobserved control group could be set up and the final results compared. Similarly, to avoid the possibility of subjects performing in a manner expected by the researchers, it is important to make sure that subjects are not aware of the anticipated outcomes of the research.

CONCLUSION AND IMPLICATIONS

In this review, the extant literature on JDM from the 10 accounting journals has been subdivided into *Person*, *Task*, and *Environment* perspectives. This subdivision has allowed clear observation of how the literature of JDM has progressed over time and how the different perspectives of JDM have influenced researchers and practitioners. The possible methods of improving the quality of judgments that have emerged from this study include using groups rather than individuals when making complex judgments, providing decision aids, changing the format of the

information provided, improving the corporate governance and internal control of businesses, and ensuring accountability.

A total of 91 papers were identified and categorized as part of this strand of research. Accounting researchers in this area have primarily used the experimental technique to uncover the effect of the factors grouped according to Bonner (1999). Although this method is quite powerful, it is difficult to reflect the actual environment in the study, which is a common limitation of most of the studies. This review suggests a number of avenues for future research in the area of financial accounting. One common trend evident from this review is that the majority of studies have focused on whether and when the variable under study will affect judgment. Relevant to the *task* perspective, one area that has been insufficiently researched is the interaction between gender and task complexity. This area will be an interesting field to explore, especially given the reality of the 21st century in which women are making significant advances toward gender equality in the workplace.

With the exception of 11 studies, all the research discussed as part of this paper was conducted in an audit context. Recently, there has been growing interest in investigating related issues in financial accounting (e.g., Clor-Proell, 2009). It can be seen that there are many important research issues related to the effects of *Person*, *Task*, and *Environment* in financial accounting, and in understanding how aspects of these institutional settings affect learning and the performance of tasks.

Although the studies reviewed have been grouped into three broad categories, the interdependence of these three perspectives is important and offers additional openings for future research. The effects of the interactions depend largely on the personal attributes of the individual, who interacts with other variables such as *Task* and *Environment*—for example, finding the interactive effects of experience and accountability on the judgment of accountants where experience is the *Person* variable and accountability is the *Environment* variable. This level of grouping also presents a better understanding of the interconnectedness of the issues at hand while presenting a better overview of what is available in the area of academic and professional research concerning JDM. There is no doubt that future research examining *Person*, *Task*, and *Environment* variables is needed and has the potential to make important contributions to accounting and auditing practice.

Finally, it should be noted that this review of JDM research is based on only 10 journals. A choice had to be made about the period to be covered (1980–2010) and the breadth of coverage. According to Trotman et al. (2011), the 1980s was an extremely inspiring time for JDM research because important themes such as probabilistic judgments on heuristics and bias, expertise paradigm, use of decision aids, and group decision making dominated the research. Conversely, some useful studies on JDM covering the *Person*, *Task*, and *Environment* perspectives published in other accounting journals are not covered in this review.

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This manuscript provides a synthesis of both the psychology and accounting literatures related to judgment and decision making, centered on a framework which has been developed on the basis of many years of teaching and research. It provides an extensive review of the importance of studying judgment and decision-making issues in accounting and also identifies a number of significant JDM topics.
4. Libby, R., and J. Luft. 1993. Determinants of judgment performance in accounting settings: Ability, knowledge, motivation, and environment. *Accounting, Organizations and Society* 18 (5): 425–50.
This study traces the development of the roles of ability, knowledge, motivation, and environment as determinants of decision performance in accounting settings, and provides a review of the ideas learnt. The primary emphasis is on finding the interactions between determinants of performance, specifying underlying cognitive processes, and abstraction based on theory and task analysis. This study shows how research which has followed these basic principles has led to a better understanding of accounting related decisions.
5. Nelson, M., and H. T. Tan. 2005. Judgment and decision making research in auditing: A task, person and interpersonal interaction perspective. *Auditing: A Journal of Practice and Theory* 24 (Supplement): 41–71.
This study discusses judgment and decision-making research in auditing, which has mostly used laboratory experiments, although some studies have also used survey and field study approaches. The extant literature of auditing judgment and decision making is classified under three broad areas:

(1) the audit task, (2) the auditor and his/her attributes, and (3) interaction between the auditor and other stakeholders in task performance. The study provides a review of how much knowledge has been generated in the past 25 years and identifies some of the gaps in knowledge that will create future research opportunities.

6. Trotman, K. T., H. C. Tan, and N. Ang. 2011. Fifty-year overview of judgment and decision making research in accounting. *Accounting and Finance* 51 (1): 278–360.

This study provides a comprehensive review of the studies in the area of judgment and decision making over a 50-year period. This review is divided by decade and is split between auditing, financial accounting, and management accounting. It shows that research questions raised in the 1970s and 1980s were further investigated in later decades with a wide range of new environmental and incentive factors.

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