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Accounting Horizons

Vol. 13 No. 4

December 1999

pp. 385-398

COMMENTARY

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Judgment and Decision-Making Research in Accounting

INTRODUCTION

The study of individual judgment and decision making (JDM) in accounting is over 30 years old. Although accounting researchers have produced literally hundreds of studies related to decision-making topics, the study of JDM continues to be one of the most vibrant and rapidly changing areas of accounting research. The aim of this commentary is to describe the purposes and importance of JDM research in accounting. The main part of the commentary provides guidelines for conducting a successful JDM research project in accounting. The final section provides a brief history of and discusses future avenues for JDM research, with particular attention to auditing topics.

What is judgment and decision-making research in accounting? To answer this question, we must first define judgments and decisions. The term *judgment* typically refers to forming an idea, opinion, or estimate about an object, an event, a state, or another type of phenomenon. Judgments tend to take the form of predictions about the future or an evaluation of a current state of affairs. The term *decision* refers to making up one's mind about the issue at hand and taking a course of action. Decisions typically follow judgments and involve a choice among various alternatives based on judgments about those alternatives and, possibly, preferences for factors such as risk and money. In other words, *judgments* reflect one's beliefs, and *decisions* may reflect both beliefs and preferences.¹ For example, an auditor makes a judgment about whether financial statements contain material misstatements. Then, he or she makes a decision about what type of audit opinion to issue based on his or her judgment about misstatements and preferences regarding client retention and litigation.

¹ Research indicates that preferences also can influence judgments (e.g., Hogarth 1987; Gilovich 1991). When this occurs, people are said to be "confusing beliefs and preferences." Discussion of this phenomenon is beyond the scope of this commentary.

This commentary is based on my presentation at the American Accounting Association Doctoral Consortium, Lake Tahoe, June 1999. I would like to thank LayKhim Ong, Geoff Sprinkle, S. Mark Young, and Susan M. Young for their comments on an earlier draft, and BDO Seidman, LLP for their financial support.

JDM research in accounting examines two basic issues.² First, it examines the quality of individual (or small group) JDM. In other words, JDM researchers seek to measure individuals' performance when doing judgment and decision-making tasks. Second, JDM research examines the determinants of both high- and lower-quality JDM. Factors that lead to lower-quality JDM can be thought of as causes of JDM "problems," while factors that lead to high-quality JDM can be thought of as remedies for those "problems." Causes of problems and remedies for problems include both input and process factors. Input factors are those that the decision maker brings to the task (such as knowledge) or faces while doing the task (such as time pressure). Process factors reflect the procedures a person goes through while making the judgment or decision. For example, people employ different information-search strategies. Causes of and remedies for problems also include both existing variables and yet-to-exist variables. For example, research might examine the effects of a proposed financial reporting standard on investors' JDM. Overall, then, the ultimate goal of this line of inquiry is to identify areas of JDM that need improvement, understand their causes, and examine the effectiveness of remedies that address the causes. The next section discusses the importance of addressing these issues.

IMPORTANCE OF STUDYING JDM IN ACCOUNTING

Why should one care about JDM issues in accounting? From a practical perspective, individuals of interest to accounting researchers make important judgments and decisions. For example, managers who *produce* accounting information choose methods of accounting for inventory. Financial analysts who *use* accounting information make judgments about future earnings (earnings forecasts). Public accountants who *audit* financial statements judge whether there are material misstatements in those financial statements. Judges who *evaluate* the work of auditors in the context of civil litigation decide whether auditors have followed professional standards in rendering an audit opinion. Finally, standard setters who *regulate* the work of accountants and auditors decide on the appropriate presentation of financial information.

More importantly, producers, users, auditors, and regulators of accounting information (and other decision makers of interest to accountants, such as judges, juries, and attorneys who evaluate auditors' work) do not always make high-quality³ judgments and decisions. In many situations, JDM reflects systematic (as opposed to random) errors. For instance, analysts' earnings forecasts tend to be optimistic under some

² JDM research is a subset of behavioral accounting research (BAR). BAR, in general, examines: (1) the behavior of individuals who are of interest to accounting researchers (see the next section of this commentary), and (2) the influence of accounting systems and information on human and organizational behavior (Hofstede and Kinard 1970; Birnberg and Shields 1989). Consequently, BAR encompasses a variety of topics beyond judgment and decision making, including job satisfaction and turnover, management control, and ethical behavior. For recent reviews of BAR, see Bamber (1993) and Arnold and Sutton (1997).

³ The quality of judgments and decisions (JDM performance) typically is determined by reference to some normative criterion for accuracy, if one exists. This criterion can be an actual outcome associated with a judgment or decision (e.g., an earnings forecast can be compared to actual earnings), or the output of a mathematical formula or model (e.g., a judgment about appropriate sample size can be compared to the size calculated using a sampling formula). If no accuracy criterion exists, consensus of one's judgment or decision with peers, designated experts, or policy often is substituted as a means of examining JDM quality. Of course, judgment performance has dimensions other than accuracy (or surrogates therefor), such as timeliness. See Bonner (forthcoming) for further discussion of other dimensions of performance.

circumstances (Schipper 1991). When making intuitive sample size decisions, auditors tend to choose samples that are too small for a given level of risk (Bonner and Pennington 1991). Less-than-optimal JDM can lead to serious financial and other consequences for the individuals making the decisions, the firms for which they work, and others who rely on their work (Ashton and Ashton 1995).

Specifically, the quality of an individual's JDM can affect his or her performance evaluation, compensation, job retention, and promotion. Recent research indicates, for example, that auditors' performance evaluations are related to the quality of their technical judgments (Tan and Libby 1997) and analysts' job turnover is related to their earnings forecast accuracy (Mikhail et al. 1999). Further, poor JDM can lead to negative legal outcomes such as payments in civil litigation (e.g., Erickson et al. 2000). Finally, persons who rely on someone else's JDM can suffer large financial losses. For example, users of financial analysts' forecasts who do not recognize the bias inherent in such forecasts may make inappropriate investment decisions.⁴

While admitting that individuals make errors in judgments and decisions (at least in laboratory settings), both practitioners and academic researchers often argue that this occurs because subjects have not been provided with the appropriate financial incentives or subjected to the discipline of a market. The jury is still out on these issues, but evidence to date suggests that incentives and markets do not always resolve problems with individual decision making, either in the laboratory or the "real world." Individuals' decisions do not always improve under incentives or markets (e.g., Berg et al. 1995; Camerer 1995; Jenkins et al. 1998; Bonner and Sprinkle 1999; Bonner et al. 1999). This is logical because incentives and markets do not address many of the sources of JDM problems, e.g., a poorly structured task. Further, incentives and markets can, in fact, decrease JDM performance. Consider the well-known problems caused by tournament incentive schemes. Tournaments can cause people to "give up" because they perceive that they cannot finish among the top performers (e.g., Dye 1984). Others who perceive they can finish at the top constantly change strategies in an attempt to do so and, consequently, have worse performance. Perhaps more importantly, because individual errors tend to be systematic, they can aggregate to create biases at the market level (e.g., Thaler 1993; Berg et al. 1995; Bloomfield et al. 1999). This finding suggests that errors in accounting-related JDM may have consequences at a level that is broader than the individual level.

There are theoretical reasons for studying JDM in accounting as well. Accounting settings have unique features for which theories in underlying disciplines are not well developed. For example, the review process in auditing is unique in that it combines elements of accountability to superiors, group decision making, and learning through feedback. More generally, accountants, auditors, and others of interest to accounting researchers are subject to the effects of regulations, professional standards, and other restrictions on practice (also see Ashton and Ashton 1995). These restrictions may not allow for the implementation of seemingly "natural" JDM remedies (e.g., incentives for

⁴ Statements about levels of JDM quality and consequences of lower-quality JDM are based on the traditional notions of quality discussed in footnote 2. However, there could be financial consequences of making "high quality" judgments and decisions, such that inaccurate judgments and decisions, in fact, benefit at least some of the parties involved. In the setting of analysts' forecasts, it has been suggested that financial analysts may benefit from biased forecasts by obtaining access to further information from management (e.g., Francis and Philbrick 1993) or by avoiding pressure from management (e.g., Bagnoli et al. 1999). Further discussion of this issue can be found in Bonner (forthcoming).

auditors based on production of unqualified opinions). Understanding how people make judgments and decisions under these conditions is important to suggesting remedies.

CONDUCTING A SUCCESSFUL JDM RESEARCH PROJECT

Suppose a researcher is interested in studying JDM issues in accounting. The next question for that researcher is how to do so successfully. There are two parts to this question. First, the researcher needs to understand how to study JDM issues in general. Second, he or she needs to consider the practical concerns that distinguish accounting (and other applied fields) from basic research. To address these questions, this section provides a framework for studying JDM issues that both delineates a logical progression of research questions and incorporates practical concerns for accountants. Then, it continues with a discussion of how to identify an important JDM research question by using institutional knowledge. Finally, the section concludes with a brief review of various methods available for conducting JDM research and their particular benefits and disadvantages.

Framework for Studying JDM Issues in Accounting

Figure 1 presents the framework. The first question in the framework is if the researcher knows whether JDM performance needs to be improved. This question relates to the first basic issue examined by JDM research—the quality of people’s judgments and decisions. While it may seem obvious, researchers sometimes proceed to other issues before answering this question. Clearly, it is necessary to document the level of performance of a particular type of decision maker (e.g., producers, users, or auditors of accounting information) in the JDM task of interest before moving on to other questions.

Once the level of performance has been documented, it is appropriate in accounting to ask: Can performance in this task be improved?⁵ Another way of phrasing this question is: Is the task worth studying? Recall that the ultimate goal of JDM research in accounting is to improve decision making. If performance in a task is relatively good,⁶ it may not be worth the effort to pursue further research because there is little room for improvement. This is an extreme position and is appropriate only for making the point that researchers should periodically recall that accounting is an applied field and, consequently, certain research topics may be more appealing than others.⁷

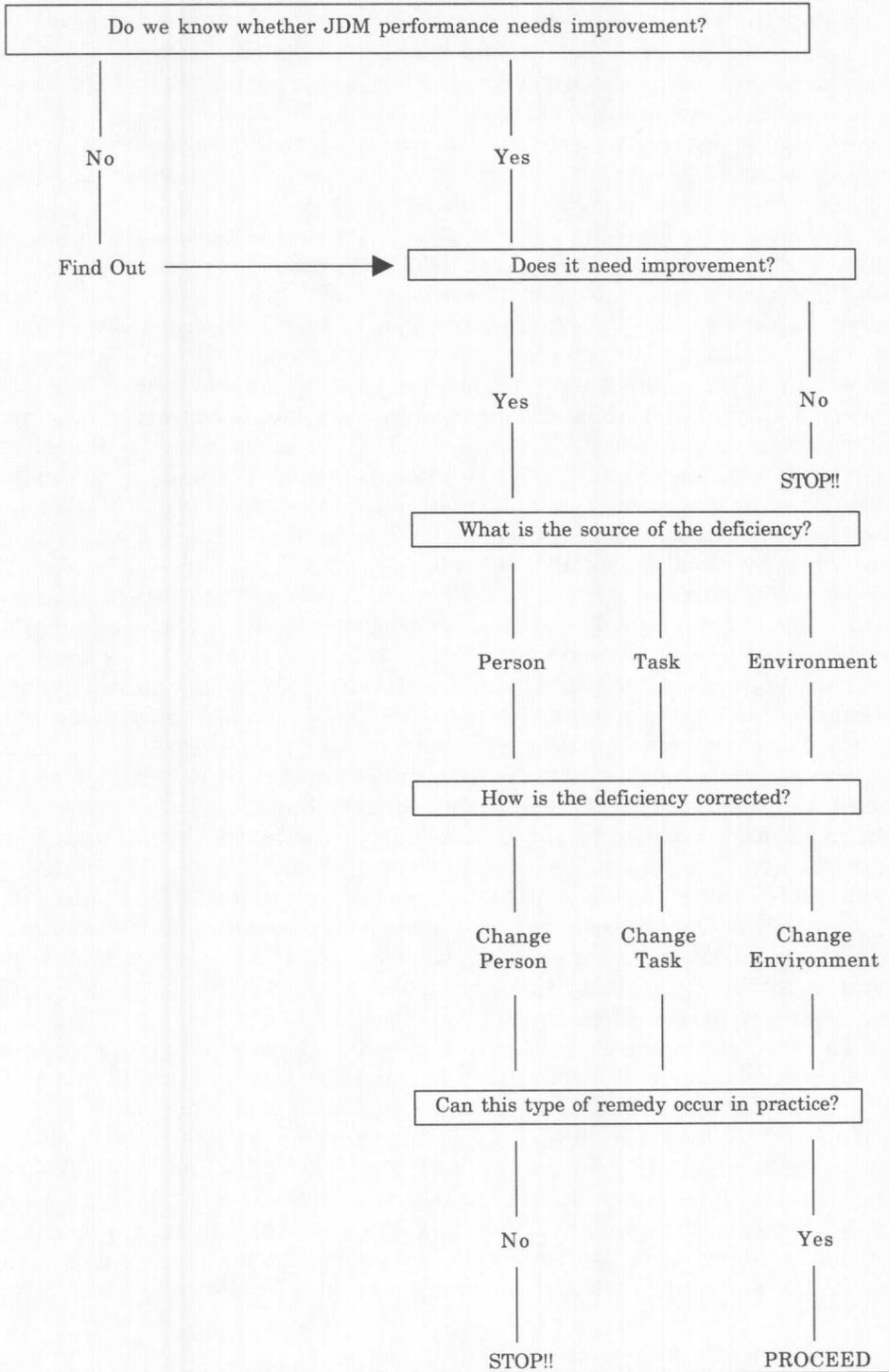
Stepping back to a more reasonable position, there are reasons for continuing to study tasks in which performance is relatively good. One reason might be that firms could understand the characteristics possessed by the experts they employ and develop training and other programs to more quickly create these characteristics in new staff. On the other hand, if high-quality performance appears to be created mostly by controls

⁵ As mentioned previously, performance in JDM tasks has multiple dimensions. Hence, the issue of whether performance can be improved is, in fact, quite complex.

⁶ “Relatively good” performance (on a given dimension) means performance that is of high, but not necessarily perfect, quality. To determine whether improvement efforts would be helpful, one must consider both the benefits and costs of improvement (as well as the costs of research to examine appropriate improvements). Further, one must consider that improvements in performance on one dimension may lead to decrements in performance on another dimension.

⁷ It also is important to keep in mind that conducting research on variables that affect JDM quality in such a task also may be fruitless from a practical perspective. That is, if the dependent variable (JDM quality) shows little variation, it will be very difficult to detect a relation between a given independent variable and this dependent variable. In other words, ceiling effects may occur.

FIGURE 1
Framework for Judgment and Decision-Making Research in Accounting



built into the work setting, research could help firms (and researchers) understand why these “natural controls” are effective. This is particularly pertinent if an organization is considering removing or changing some of these controls. Another reason for continued study is the prospect of an externally imposed change that has the potential to decrease the quality of JDM. A typical proposed change of interest to accountants is a financial reporting standard or another type of regulation. A final reason for continued study is that the task may be important for other purposes. For example, one reason a great deal of research has been conducted on the properties of analysts’ earnings forecasts is to better understand their advantages and limitations when used as earnings expectations in non-JDM studies.

Although it could be argued that a JDM research project in accounting should be pursued when the answer to the question of whether performance can be improved is “no,” the answer to the question is normally “yes.” Once it has been determined that performance can be improved (or there are other justifications for continuing to study the task), the next logical step is to unearth the variables that affect performance. As shown in the framework, these variables can be classified into three general categories: person, task, and environment. Person variables relate to characteristics the decision maker brings to the task, like knowledge. Task variables relate to dimensions of the task *per se*, e.g., its complexity.⁸ 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.

Once variables that affect JDM performance have been investigated, the next step is to determine how to remedy any observed deficiencies. While this process may appear to be a practical problem of allocating scarce resources in a firm, e.g., between recruiting programs and training programs, research can be helpful on at least two fronts. First, as mentioned earlier, research that examines causes of JDM deficiencies can examine process explanations for those deficiencies. Understanding the process factors that affect JDM performance helps narrow the range of plausible remedies. For example, if people tend to engage in poor statistical reasoning while making a judgment, training would not be a plausible remedy because statistical reasoning fallacies tend to be somewhat “hardwired.” Second, research can examine the as-implemented effectiveness of plausible remedies. Even theoretically plausible solutions do not always improve JDM (e.g., Kachelmeier and Messier 1990). Further, remedies that actually improve JDM in one task may create problems in other JDM tasks. For example, Bonner et al. (1996) note that a decision aid that improves auditors’ performance on a particular type of conditional probability judgment may create problems in other probability judgments.

The final question in the framework is the second question that is somewhat unique to the applied domain of accounting. This question asks whether the type of remedy that the researcher is proposing to study, and ultimately considering suggesting to practitioners, can occur in practice. Consider a research project that finds time pressure to be a significant source of difficulty in a particular auditing task. The logical suggestion one might propose from this finding (and the finding that a group of subjects without time pressure performs substantially better) is to remedy the problem by reducing time pressure. Since most auditing firms note that they cannot do this in today’s competitive environment, it is likely that this remedy would not be feasible. Again, the

⁸ A task is a piece of work assigned to or demanded of someone.

framework makes an extreme point by suggesting that the researcher should not proceed with a project that results in a “no” answer to this question. The point is for the researcher to think through the entire framework (as it relates to any given project or line of research) and consider what suggestions about decision improvement he or she ultimately would make. If these suggestions would not be appropriate for practice, a reframing of the project(s) is in order. The previously mentioned study of the effects of time pressure on auditors’ JDM could consider examining other variables that could alleviate its ill effects, e.g., expertise. In this way, the researcher would be able to discuss not only the time pressure problem, but feasible remedies as well.

Identifying an Important JDM Research Issue

Of course, this framework is useful only once an interesting and important JDM issue in accounting has been identified and there is some preliminary information about levels of performance, possible sources of deficiencies, and restrictions on remedies in practice. How does one go about identifying an interesting and important JDM issue? How does one identify problems people might have with a task and constraints on remedies? The answers to these questions are, respectively, by using general institutional knowledge and detailed, task-specific institutional knowledge, the latter of which is gained through a process called “task analysis.”

General institutional knowledge typically relates to one of the functional areas of accounting, e.g., managerial accounting, or to a particular group of individuals of interest to accounting researchers, e.g., financial analysts. Having general institutional knowledge about financial analysts means that one understands the tasks analysts perform as part of their job, the organizational factors that influence their work (e.g., performance measurement and reward systems), the characteristics that are perceived to be important for their work (e.g., expertise in a particular industry), and the general sources of information they tap.

A successful project also requires task-specific institutional knowledge. Gaining this knowledge through task analysis (Newell and Simon 1972; Zemke and Kramlinger 1982; Desberg and Taylor 1986) entails specifying, at a very detailed level, the steps one goes through to perform a task (including the information used) and the skills one needs to perform those steps adequately. The techniques used for task analysis include reading various documents and reviewing records that show the actual performance of the task. Documents to read include company manuals and flowcharts, professional standards, textbooks and training manuals, practitioner articles, case studies, and workpapers and memos completed by practitioners. One also should reference the related archival literature (e.g., Hirst et al. 1995; Libby and Tan 1999). For example, an archival study that examines the factors that investors *appear* to consider in valuing a particular account (as evidenced by stock prices) might provide some indirect evidence about the *actual* steps investors go through in making such judgments.

In addition, researchers can ask a small number of individuals to perform the JDM task and think aloud as they do so (or directly after they finish). To provide these concurrent (retrospective) verbal protocols (Ericsson and Simon 1996), subjects are asked to tell the researcher what they do while they are performing the task. For example, a researcher could ask an auditor to think aloud while he or she performs analytical procedures for a specific retailing company, specifically to delineate the ratios and other calculations of most relevance. An alternative to gathering protocols that are specific to a given case is to ask questions that are more general in nature; this allows for inquiry

about factors that vary across situations. These questions can be asked in the form of structured or unstructured interviews or surveys (see Hirst and Koonce [1996] for an example). Finally, it goes without saying that the researcher should perform the JDM task him- or herself.⁹

Task analysis can be painfully detailed (see Bonner and Walker [1994] for an example), but is absolutely critical for a successful study. It can help the researcher discover the "big potatoes"¹⁰ for a particular JDM task (the variables that are most likely to explain a large amount of variation in individuals' JDM performance). For example, one may note that there is substantial variation in the information individuals purport to examine, leading to an investigation of information search as a key determinant of performance. Without a task analysis, the researcher mistakenly may believe that information search is a trivial component of the task. Task analysis also can be quite helpful in identifying theories appropriate for hypothesis development. Certain tasks that auditors and other accounting professionals perform have properties similar to those of medical diagnosis tasks so that theories about medical JDM may be appropriate for use in these settings. Choosing appropriate theories, in turn, can lead the researcher to consider variables either to include or control for in a study because the theories indicate that these variables interact with the variable of interest. Next, a thorough task analysis helps a researcher construct successful manipulations or measurements of variables. Finally, as mentioned previously, a thorough task analysis forces the researcher to think about constraints on solutions prior to conducting research projects and, in so doing, helps the researcher avoid projects that, in the applied setting of accounting, "miss the forest for the trees."

Choosing Research Methods to Address JDM Issues

Once the researcher has identified an important JDM question and conducted a thorough task analysis, there remains the issue of which method to employ for addressing the main research question.¹¹ The mainstay of most JDM research in accounting is experimentation or passive observation similar to experimentation (in the latter method, all variables are measured rather than manipulated, but control is similar to that in an experiment). This is not surprising given that the focus of experimentation is on individual (or small group) task performance. More importantly, experiments allow the researcher to control for alternative explanations for results through random assignment of subjects to treatments, factorial design and holding factors constant, and good measures. These dimensions of experiments, along with their capability to examine processes, allow for better attributions of the causal nature of relations between independent variables and JDM performance (with archival data analysis, the researcher can draw only associational inferences). Again, understanding the causes of JDM problems is of paramount importance to suggesting remedies therefor.

A more recent impetus for using experiments to address JDM questions in accounting is to conduct *ex ante* research related to policy issues (e.g., Maines 1994; Schipper

⁹ Each of these task-analysis procedures has its disadvantages. Documents may be out of date or inaccurate. Records that document actual performance of the task may not fully reflect what was done. Verbal protocols are time consuming to gather and difficult to analyze. In answering interview or survey questions, people may have poor memory and/or insight into how they perform the task. For all these reasons, task analysis is an important precursor to, not a substitute for, a rigorous research study.

¹⁰ Kinney, W. 1983. Notes from research methods class, University of Michigan.

¹¹ For a more thorough discussion of the strengths and weaknesses of various research methods, see Kinney (1986).

1994; Hussein and Rosman 1997). Because experiments allow the researcher to manipulate just about anything (within the realm of what a human subjects committee considers reasonable), they can provide information about the effects of something that does not exist in the "real world," e.g., a proposed change in financial reporting standards. This advantage of experimentation is particularly important for examining research questions about potentially costly remedies for JDM problems prior to their implementation. A final reason for using experiments is the lack of publicly (or even privately) available archival data on individual JDM. For example, individual investors' judgments are not recorded publicly in any systematic manner, so that access to a special proprietary database is required (see Odean [1998] for an example).

For situations in which archival data are available, research has tended (until recently) to employ archival data analysis. A particularly striking example of this is research on sell-side analysts' forecasts (see Schipper [1991] for an overview). Archival analysis certainly has some advantages over experimentation when studying JDM issues. Perhaps foremost among these is that the researcher forgoes the need to secure the assistance and serious experimental participation of very busy and highly paid professionals. This is a nontrivial issue when considering some of the groups of interest to accounting researchers, such as analysts, standard setters, and judges. Additional advantages of archival data analysis as compared to experimentation are the external validity it provides and the ability to assess the economic significance of variables of interest. Experiments, by necessity, abstract from the real world and sacrifice some external validity.¹²

Unfortunately, of course, archival data analysis has some severe limitations related to the testing of hypotheses about individual JDM. It is far more difficult to disentangle the effects of correlated variables such as knowledge and information-search strategies with archival analysis than with experimentation. An experiment can create a situation in which such variables are not confounded through the use of factorial design. For example, the researcher could direct or teach subjects to use different search strategies in different conditions. Conclusions from archival data analysis also may reflect selection biases. Consider the inference that sell-side analysts learn from experience based on the finding that experience is related to forecast accuracy. This is problematic in that additional experience may only be "granted" to individuals whom firms select for retention and promotion based on some other factor like ability (Mikhail et al. 1997). Because experiments randomly assign individuals to treatments or use *a priori* matching on factors of interest (e.g., ability), selection biases can be eliminated.

Additionally, when conducting archival data analysis, variable measurement is limited by the state of the data (and the researcher's cleverness). This is a particularly egregious problem for JDM research since, as mentioned earlier, few databases contain the dependent variable of interest (individual judgments or decisions). Important independent variables such as knowledge also typically are not available. Thus, archival researchers often must employ weak proxies for both dependent variables (e.g., stock prices for individual judgments and decisions) and independent variables (e.g., general experience for task-specific knowledge). Finally, archival researchers clearly cannot examine process factors or conduct *ex ante* research, both of which are important for suggesting JDM remedies.

¹² I would argue, however, that a thorough task analysis can alleviate this problem to some extent.

Experimentation and archival data analysis are the most typical methods for studying JDM in accounting, but theoretical modeling also is appropriate (see Trueman [1990, 1994] and Hayes [1998] for examples). Its current lack of popularity likely reflects the background and interests of accounting modelers rather than the usefulness of the method. For modeling to succeed as a JDM method, some change of focus is required. Modelers typically assume that individuals make rational decisions and are homogeneous, except perhaps as to information sets. Given that JDM research focuses on the sources of and remedies for less-than-optimal JDM, which include individual differences in abilities, knowledge, motivation, and other characteristics, these assumptions are not appropriate. A clear advantage of modeling is that it does not require data. Given the lack of archival data and the difficulty of obtaining certain types of subjects for experiments, this is indeed a strong advantage.

Methods that are less useful for studying JDM are surveys and interviews. These methods are useful for many areas of accounting research and for task analysis leading up to JDM studies, but suffer from some serious disadvantages when it comes to studying JDM. In these methods, people typically do not make judgments or decisions. In order to measure JDM performance (the typical dependent variable), then, people must either recall specific judgments or decisions or rate their own JDM performance in general. When people *recall* judgment and decisions, they may suffer from a variety of biases such as the hindsight bias. The hindsight bias occurs when an outcome related to the decision has occurred since the time of the judgment and people report the outcome as having been their initial judgment (when, in fact, it was not). When people *rate* their own JDM performance, they may exhibit overconfidence and overestimate their performance. While some contend that these biases are not problematic in that they simply increase average JDM performance, this is not necessarily the case. If some subjects overestimate their capabilities while other subjects underestimate their capabilities, the difference between these two types of subjects is systematic, and the researcher does not recognize this omitted variable prior to conducting the study, surveys or interviews can lead to incorrect conclusions about the factors that affect JDM. As an example, consider the finding that there are gender-related differences in overconfidence (e.g., Estes and Hosseini 1988; Lundeberg et al. 1994; Barber and Odean 1998). Finally, there are problems with measurement of independent variables as well when these methods are used. Put simply, people have difficulty explaining and describing their JDM. In other words, people lack insight into their own JDM inputs and processes. Somewhat paradoxically for researchers who would contend that surveys and interviews are acceptable for studying JDM as long as one appeals to expert subjects, lack of self-insight increases with expertise. As persons increase their expertise at a particular task, what they do in that task tends to become more automatic and less available for conscious description (Anderson 1990, 1995).

FUTURE JDM RESEARCH IN ACCOUNTING

While JDM research has been conducted in all functional areas of accounting, JDM research in auditing is the most mature. Auditing has been the predominant functional area for JDM research since the 1970s (see Ashton and Ashton 1995; Bamber 1993). The current state of JDM research in various functional areas can be examined by referring to Figure 1. In auditing, most current work relates to remedies for observed JDM deficiencies, with a smaller portion of the field being devoted to understanding sources of deficiencies. In contrast, for other areas, a glimpse at the framework reveals that they are ripe for research. In many areas, the issue of whether JDM needs

improvement has not even been asked or is still being debated. There are whole classes of individuals of interest to accounting researchers about whose JDM research is minimal. These include internal auditors, cost accountants, and jurors.¹³ In these areas, the research topics of interest are too numerous to describe in this commentary. Thus, the focus of the remaining discussion is on auditing.

With regard to auditing, although JDM research is relatively mature, there are a number of fruitful avenues for research. First, one can explore a variety of JDM questions related to new assurance services on the relevance or reliability of financial and nonfinancial data and systems (e.g., Elliott 1995, 1997; Fargher and Gramling 1996; King and Schwartz 1998; Anderson et al. 1999). For example, it is important to understand what skills are needed to perform these services competently. Second, there are many questions related to the effects of technology both on assurance services and JDM in general (Elliott 1995, 1997; Mauldin and Ruchala 1999). As an example, research could explore how users' JDM will change when they have real-time access to corporate databases as opposed to periodic reports.

Third, while there is a great deal of research on remedies for observed JDM deficiencies in auditing, this research focuses on relatively few categories of remedies such as accountability and decision aids. A number of other remedies such as training (Bonner and Walker 1994) and personnel assignment (Prawitt 1995) are both plausible for observed problems and potentially less costly than other options, yet their as-implemented effectiveness is underexplored. Fourth, because ultimately it is the evaluation of individual auditors' or audit firms' performance that matters to JDM-related outcomes such as compensation and legal fines, it is important to continue the relatively recent work on the evaluation of auditors' JDM by interested parties. These interested parties include superiors within the firm (Kennedy and Peecher 1997; Tan and Libby 1997), outside users of auditors' work (Kinney and Nelson 1996), and judges, juries, and plaintiffs' attorneys (Anderson et al. 1997; Bonner et al. 1998; Kadous 1998). Finally, research should continue to examine the function of auditors as part of financial markets (Hackenbrack and Nelson 1996; Phillips 1999).

CONCLUSION

JDM research in accounting seeks to understand and improve the judgment and decision making of individuals of interest to accounting researchers, including producers, users, auditors, and regulators of accounting information, and evaluators of accountants' and auditors' work. This research is important because these individuals make important judgments and decisions, the quality of their JDM is not always good, and suboptimal JDM can negatively affect careers, legal outcomes, and other individual and market-level financial outcomes. Studying JDM issues in accounting requires an understanding of the logical progression of JDM research in general and the peculiarities that an applied field adds to this logical progression. Finally, JDM researchers in accounting must gain general and task-specific institutional knowledge and apply appropriate research methods.

¹³ A clear caution when considering these areas is, again, to employ institutional knowledge and task analysis to define a research question relevant thereto.

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