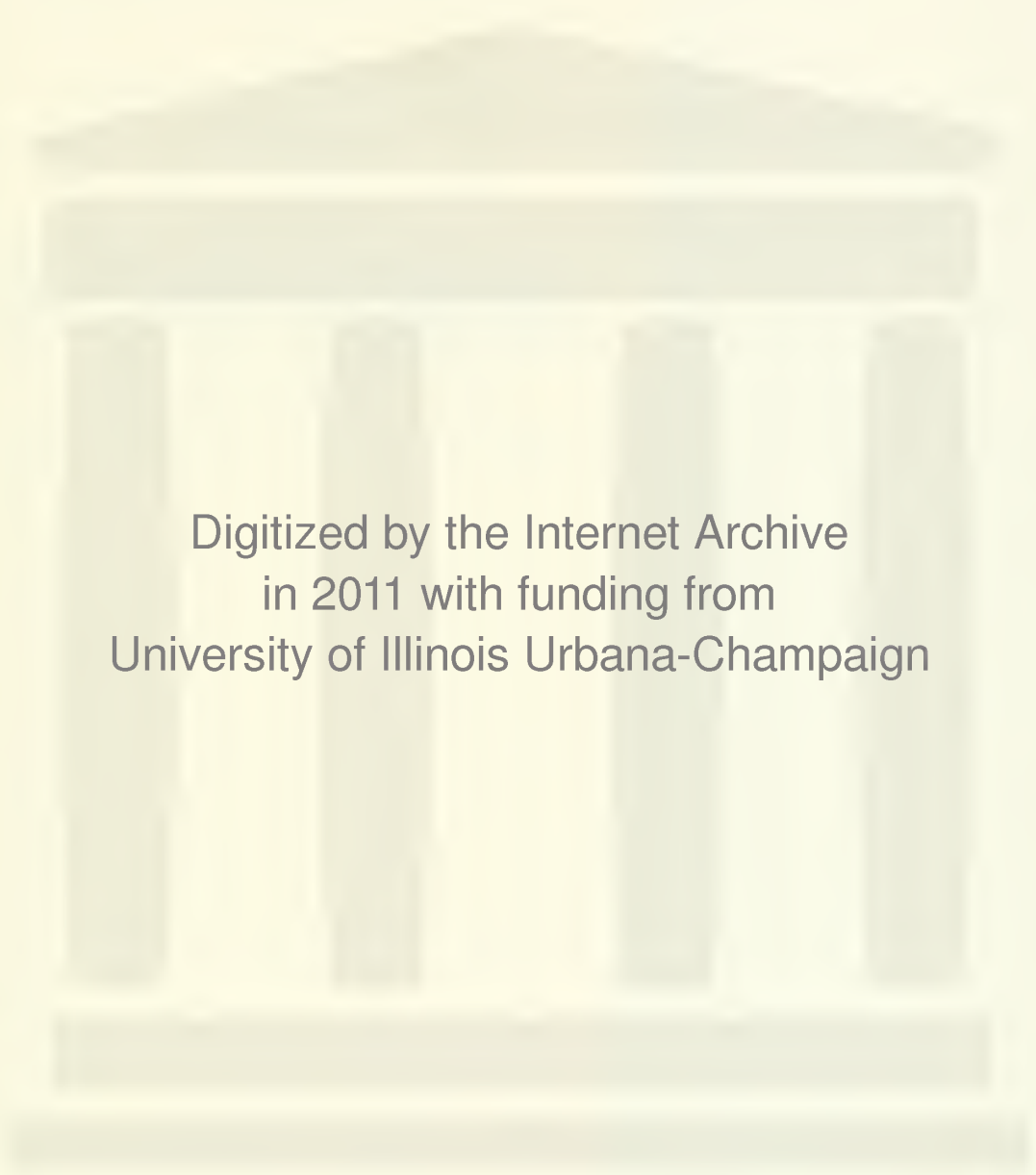


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Experience, Expertise and
Expert-Performance Research
in Public Accounting

Jon S. Davis
Ira Solomon

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Experience, Expertise and Expert-Performance
Research in Public Accounting

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EXPERIENCE, EXPERTISE AND EXPERT-PERFORMANCE RESEARCH IN PUBLIC ACCOUNTING

Abstract

Following Choo [1989] and Colbert [1989], this paper raises issues concerning the treatment of experience and expertise in the accounting literature. Two central themes are adopted. First, given the motivations underlying accounting expertise studies, performance-based notions of expertise are most appropriate. Second, experiential learning sufficient for cognitive development and related expert performance, as traditionally defined, is unlikely to occur naturally in many public accounting tasks. This insufficiency is due both to public accountancy task characteristics and the limited applicability of competitive forces as a means of ensuring expert performance. Implications are that, for traditional views, experience is a suspect expertise (or expert performance) surrogate and such surrogation is likely responsible for many of the inconsistent results reported by expertise studies over the past decade. Prescriptions for future research then are described including the need to study the relationship between cognitive development and expert performance and the importance of experimental task design when studying expertise.

EXPERIENCE, EXPERTISE AND EXPERT-PERFORMANCE RESEARCH IN PUBLIC ACCOUNTING

1.0 INTRODUCTION

Accounting researchers have reported a number of studies over the past 15 years in which experience or expertise¹ has been addressed either as the focal point of the study or as an incident to other issues. Choo [1989] and Colbert [1989] review these studies, the former taking a broad perspective encompassing judgment and decision research in accounting and the latter focusing on studies of experience/expertise in auditing. Based on these and many of the underlying studies, we have developed a number of perspectives on this line of research. The purpose of this paper is to communicate these perspectives in the hope of facilitating advancement of accounting experience/expertise research.

Two features of many of the extant accounting studies are a failure to distinguish between experience and expertise and a concomitant vagueness of the purpose of the inquiry. Possible purposes include directly studying expertise or experience effects, or as often attempted, indirectly studying expertise by employing experience as a surrogate. As a consequence of the vagueness of purpose of prior research, however, readers often do not know whether it is experience or expertise that was the construct of primary interest nor do they know why that construct was studied. A related aspect of extant studies is that they have given inadequate attention to the conditions under which experience is an appropriate surrogate for expertise. At a minimum, such attention would require identification of the circumstances under which experience alone will result in sufficient acquisition of knowledge, organization and most importantly, the ability to use that knowledge such that judgment/decision performance is at the "expert" level.

Issues related to these observations are discussed in the remainder of this paper for the contexts of external auditing and tax (hereafter, public accounting contexts). Specifically, Section 2 begins by defining experience and expertise and argues for performance-based notions of expertise in public accounting contexts. Alternative perspectives on performance measurement also are discussed in Section 2. Section 3 discusses learning models with the focus on Anderson's [1985, 1987] model of skill acquisition. In addition, factors affecting experiential learning are discussed with outcome feedback emerging as critical. The limited availability of such feedback for the types of tasks which accounting researchers traditionally have studied then is noted. Implications are that, in many public accounting contexts, experience is a suspect surrogate for expertise and expert performance and that such surrogation is likely responsible for many of the inconsistent results reported by expertise studies over the past decade. Section 4 completes the paper by presenting prescriptions for future research and concluding remarks. Included among the prescriptions are a need for further study of how (and to what extent) cognitive variations (e.g., in memory organization) map into improved performance, how individual ability differences arise for limited-feedback tasks, and the need for care in designing expertise experimental tasks.

2.0 EXPERIENCE AND EXPERTISE: DEFINITIONS

Experience generally has been defined as longevity in a particular position or in performing a particular task. In comparison, various definitions of expertise have been employed by researchers in accounting (see Bédard [1989], Choo [1989], and Colbert

[1989]) and psychology interested in experience and expertise effects. Chi, Glaser and Rees [1982, p. 8], for example, representing what has been called the "Cognitive Science" view (see Bédard [1989] and Johnson [1988]), define expertise as "the possession of a large body of knowledge and procedural skill." Based on this definition, it has been reported that, relative to non-experts, experts have in memory better and more complete representations of the task domain, that they encode new information more efficiently and completely, and that they have richer decision strategies as well as more appropriate mechanisms for appraising such strategies (see Johnson [1988, p. 210]).

Alba and Hutchinson [1987, p. 411], however, define expertise, in the context of research on consumer knowledge, as "the ability to perform product-related tasks successfully." This definition differs from the former in that Alba and Hutchinson explicitly recognize that the aforementioned cognitive attributes must be brought to bear on tasks in such a way that superior performance (at least over the long run) results. In early policy-capturing and heuristics-biases (hereafter behavioral) studies in accounting, performance-based notions of expertise were explicitly or implicitly emphasized. Latter researchers moved away from performance-based notions, emphasizing instead a cognitive perspective and implicitly assuming that observed differences lead to expert performance. As noted by Jacoby, Troutman, Kuss and Mazursky [1984], the trend away from performance-based notions of expertise was due to the difficulty of objectively measuring judgment/decision quality. Some accounting researchers, however, (e.g., Frederick and Libby [1986] and Gibbins [1988]) recently have begun to re-embrace performance-based expertise notions while still emphasizing cognitive differences.

While recognizing the continuing importance of studying cognitive differences, for contexts such as accounting, we contend that a performance-based notion of expertise is most appropriate. Our contention is based on the observation that performance is inherent in motivations most frequently cited for studying expertise in accounting. For example, one motivation is that, as the nature of expertise in accounting is better understood, it may be possible to extract experts' knowledge structures and make them available to others, either through the development of expert systems, or through education efforts, thereby improving performance. Another performance-based motivation is that research might indicate settings in which experts are likely to make poor decisions (e.g., Frederick and Libby [1986] and Johnson [1988]), thus pinpointing settings in which it would be beneficial to develop decision aids or adopt other approaches to reduce the likelihood of these adverse events.

2.1 Performance-Based Notions of Expertise

Having concluded that performance-based notions of expertise are most appropriate in public accounting settings, we now discuss how expert performance might be measured. Appropriate measures may be gauged by (1) efficiency and/or (2) effectiveness. Efficiency measures generally concern the quantity of resources expended to perform a given task. Effectiveness, on the other hand, addresses how well a given task is performed—a much more difficult concept to quantify. A first step in examining effectiveness is to identify the referent for which one is attempting to be effective. The applicability of a referent, however, is task-specific. For example, accuracy could be an appropriate referent for predictive tasks in which the outcome will become known. To illustrate, in concert with the preparation of a

bid for a prospective engagement, an estimate might be made of the number of hours it will take to complete the engagement. After the engagement has been completed, one could compare the estimate with the actual number of hours it took and, thereby, determine both how accurate the former is and, over a sequence, how effectively the judge performed. Another possible outcome referent is the success or failure of an action. For example, judgments/decisions made by an auditor in connection with efforts to acquire new clients and retain extant clients can be appraised by observing if they did or did not lead to the desired outcome.²

For many public accounting tasks, however, there will be no timely revelation of an outcome referent which can be used to gauge effectiveness (from an accuracy or success perspective; see Ashton, Kleinmuntz, Sullivan, and Tomassini [1988]). To illustrate, for the tasks of inherent risk appraisal, judging materiality and control system reliability, there really is no correct value, nor can success/failure be readily gauged as a means of judging performance.³ Further, it is this sort of "technical" judgment/decision task that has been the most common focus of accounting researchers' attention.

When outcomes are not available, judgment/decision justifiability and defensibility can become effectiveness referents. Such foci have been observed in public accounting settings [Gibbins and Emby, 1985]. Hereafter, because of the emphasis on justifiability and defensibility of the judgment/decision process, these effectiveness referents are referred to as "process" oriented. Having noted the variety of performance measures that may be used for various public accounting tasks, we now turn to a discussion of how experience affects learning and, in turn, expert performance, both in general and in public accounting.

3.0 LEARNING THROUGH EXPERIENCE AND EXPERT PERFORMANCE

Current learning theories address many domains including categorical learning in abstract experimental tasks [Medin and Schaffer, 1978], acquisition of frequency data [Hinzman, Nozawa, and Irmischer, 1982], categorical learning without feedback [Birnman and Heit, 1988], inductive learning [Holland, Holyoak, Nisbett, and Thagard, 1987], and skill acquisition [Anderson, 1982, 1985, 1987]. Several of these theories have been employed in accounting; Butt [1988] applied frequency learning to an audit context and Gibbins [1988] borrowed aspects of Anderson's [1987] theory of skill acquisition to describe how auditor expertise develops over time.

We contend that, for expert performance in public accounting tasks, learning models incorporating feedback are most applicable. To illustrate the importance of feedback learning in accounting contexts, consider auditors' usage of financial ratios. Absent feedback, auditors might form and retain categories of companies that are unlikely to be differentiated on a dimension of relevance (e.g., bankruptcy). Consistent with our contention, and due both to the nature of typical public accounting tasks and the emphasis of earlier studies, we focus herein on a skill acquisition model incorporating feedback, thereby emphasizing a linkage between cognitive development and expert performance.

3.1 Anderson's Model of Skill Acquisition

Anderson's [1982, 1985, 1987] skill acquisition model consists of three stages: cognitive, associative, and autonomous. In its first stage, the model recognizes that

learning involves both acquiring and practicing the application of declarative knowledge. The acquisition of declarative knowledge, such as facts and rules about tasks, is accomplished through formal education (instruction and textual materials) or on-the-job, through instructions manuals, checklists, etc. When performing a task, the trainee uses his/her declarative knowledge with general problem-solving skills such as analogy, means-ends analysis, or a trial-and-error search (for evidence of the initial use of such skills, see Simon and Simon [1978]). As a task initially is practiced, models of correct behavior contained in the declarative knowledge base may be mentally rehearsed and experiences gained during practice are added to that base (e.g., successes and failures, etc.). Knowledge acquired at this stage generally is considered to be insufficient for expertise.

In the second "associative" stage of skill acquisition, errors in the initial understanding of the task gradually are detected and eliminated through practice and feedback. In addition, the phenomenon of "knowledge compilation" produces new, domain-specific problem-solving procedures (production systems) that replace the general problem-solving procedures used previously (for evidence of the development of production systems, see Simon and Simon [1978] and Anzai and Simon [1979]). The procurement of these production systems, incorporating the declarative knowledge necessary for task performance (called "proceduralization"), leads to a reduced ability to verbalize task knowledge. In addition, production systems may contain a collapsed version of the individual steps and general problem-solving procedures previously used in addressing the task (called "composition"). The effect of "composition" is to speed up task performance.

As domain-specific problem-solving procedures are created and used, knowledge regarding the conditions under which these procedures should be applied also is acquired. Application of new production systems to new problems is performed, for example, by drawing analogies to earlier successful applications. Thus, new production systems, with practice and feedback, may be generalized to groups of similar instances, resulting in knowledge of when domain-specific problem-solving procedures are effective [Lewis and Anderson, 1985, p. 27]. Expertise continues to develop in the third, autonomous stage which can be viewed as an extension of the associative stage. At this level, as the domain-specific problem-solving procedures become stronger and the mapping of these procedures to a variety of problems leads to greater robustness, application of the procedures becomes automatic and even more rapid. Hereafter, we employ the term "expert" to describe a judge/decision maker who has reached either the associative or autonomous stages.

To illustrate the skill acquisition process in a tax setting, consider a novice tax accountant who sets out to accomplish a task (e.g., achieve a tax-free transaction). In such a situation, the novice would apply relevant declarative knowledge (acquired through formal education and self-study) that he/she possesses for such transactions and for tax research, in conjunction with a general problem-solving method. Subsequently, success or failure regarding the actions taken to accomplish the tax-free transaction would be added to the declarative knowledge base. Then, after considerable practice and the accompanying knowledge composition process, the tax researcher no longer may consider consciously the general steps in conducting tax research and associated declarative knowledge when

solving tax research problems. Rather, he/she will have developed a refined unconscious representation of the specific actions necessary to reach a solution given a specific type of problem. Upon development of domain-specific production systems, the tax researcher has crossed the threshold for expertise and should exhibit some degree of expert performance. Further, with additional practice and feedback, application of tax research procedures will become more robust, rapid, and automatic.

3.2 Factors Affecting Experiential Learning

Drawing upon the insights provided by Anderson's skill acquisition model, we now discuss factors mediating experiential learning, including novel settings, experiential transfer, and most importantly, feedback.⁴ Subsequently, implications are discussed for cognitive development and expert performance in public accounting.

3.2.1 Novel Contexts and Experiential Transfer

One important aspect of experience in the associative and autonomous stages is the extent to which novel contexts are encountered. Rumelhart and Ortony [1976], for example, note that the goals of instruction should include not only the creation of new knowledge structures, but also the ability to use them. Larkin [1981, p. 318] further suggests that the ability to use a specific element of knowledge in a variety of novel circumstances arises through practice. This ability, observed in experts, may be equivalent to a categorical judgment [Gibbins, 1988, p. 60]. That is, the expert might judge the new problem as belonging to a specific category and bring the appropriate domain-specific

problem-solving procedures to bear. Through repeated practice with a particular task in a variety of contexts, experts are able to store a rich variety of cue-context experiences in memory which lead to the development of procedures for solving specific problem types. Representation of the resulting problem categories may be in the form of prototypes, or may derive exclusively from stored exemplar information (e.g., cue-context experiences). In either case, problem-solving, for the expert, requires categorization of problems into one or more problem types and application of the appropriate production systems. Experience in a variety of contexts, therefore, facilitates the formation of problem categories that are sufficiently rich to allow their successful application to the vast array of situations encountered by an expert.

Another issue related to the impact of experience on the development of expertise concerns the transfer of experience. Research has shown, for example, that the effects of experience with similar cognitive tasks can have positive effects on learning. This effect is predicted by the Anderson [1987] model; when two skills involve the same production systems, some positive transfer can occur. To illustrate, Singley and Anderson [1985] investigated experiential transfer between word processing programs. Depending on the similarity of the programs, they found that practice on one program eliminated between 60 and 90 percent of the work in learning to operate a second word processor. Thus, in this instance, a positive transfer between tasks was observed. To the extent that existing production systems can be used to perform new tasks, therefore, experience may have a synergistic effect, ceteris paribus.

3.2.2 Feedback

The importance of feedback to learning has been recognized for decades. For example, Hoch and Loewenstein [1988, p. 29] state that,

Throughout psychology, accurate outcome feedback is recognized as the most important determinant of the adaptivity and rate of learning [Einhorn and Hogarth, 1976; Einhorn, 1960a]. Without feedback, how can we possibly learn effective judgment and decision making policies? What our research and previous research . . . demonstrates is that outcome feedback is a necessary though not sufficient condition for adaptive learning to take place.

From the perspective of Anderson's learning model, feedback must be provided in both the cognitive and associative stages to permit the refinement of knowledge relating to the task. Indeed, absent appropriate feedback from task performance, one is not likely to progress beyond the cognitive stage.

In Exhibit 1, we describe the types of feedback typically present in the public accounting arena, for audit and tax. An example in the audit setting is used as a vehicle for discussing the major elements of this exhibit. Consider first that an auditor, using prior knowledge and current information about the control environment, accounting system, and extant control procedures, assesses internal control risk to be very low. The auditor, therefore, restricts the extent to which tests of details are employed, relying instead on analytical procedures as substantive verification of account balances. Now, consider the nature and timeliness of the feedback which may be provided to the auditor.

[Insert Exhibit 1 here]

Exhibit 1 indicates that outcome feedback may be available from both direct and indirect tests. An example of the former would be control procedure compliance tests which would be either consistent or inconsistent with the auditor's low control risk

assessment. The results of these tests would be consistent (inconsistent) with the auditor's low control risk assessment if they reveal that a small (large) proportion of transactions have not been processed in accord with extant control procedures. An example of indirect feedback is provided by the analytical procedures which may reveal either the presence or absence of an unexpected fluctuation. The analytical procedures' evidence also could be consistent (inconsistent) with the original control risk judgment. If no unexpected fluctuation were identified (or, alternatively, the cause of a fluctuation were deemed to be unrelated to a financial statement error), the analytical procedures would have provided indirect evidence confirming the low control risk judgment. Alternatively, if the cause of an unexpected fluctuation were deemed to be a financial statement error, the analytical procedures would have provided indirect disconfirming feedback with respect to the original control risk judgment.

However, the probability of the auditor detecting a financial statement error may be quite low when analytical procedures are substituted for tests of details (it certainly is lower than if he/she had performed tests of details). Further, consistent with the concept of Outcome Irrelevant Learning Structures (see footnote 2), many auditors may not even recognize analytical procedures evidence (e.g., that a financial statement error occurred) as feedback for the original control risk judgment.

Exhibit 1 also reveals that if the auditor were not to detect the financial statement error via the less costly (and presumably less effective) analytical procedures, the next most likely source of feedback would be one form or another of review. Three levels of such review are identified in Exhibit 1, all of which are focused on the process of judging or

deciding. The hierarchical audit team structure provides process feedback during the engagement on the extent to which documented and material judgments/decisions comply with public accounting firm and professional standards [Solomon, 1987]. The emphasis of this feedback is on judgment/decision justifiability and defensibility vis-a-vis such standards. In addition, near the end of the engagement, a partner not involved in the audit typically will examine select material judgments/decisions to appraise the extent to which documentation is adequate (i.e., whether such documentation evidences that firm and professional standards have been followed, for purposes of defensibility). Similarly, on an even more select basis, in-house and peer reviews may result in a further appraisal of the extent to which these standards have been followed. Yet another form of feedback, external to the audit, could stem from a lawsuit requesting damages for an audit failure. Such feedback could concern both the outcome and whether CPA-firm and professional standards have been followed. However, besides potentially being very costly, judicial feedback is relatively rare and always is distanced in time from the original judgment/decision.

Feedback in the tax setting is analogous to the audit setting, with the exception of audits performed by the tax agency on returns. During a tax audit, feedback may relate to both outcomes (whether specific reporting procedures are allowed on a return) and procedures (whether procedural guidelines provided by the government have been followed). At this level, justifiability/defensibility of the reporting position (documented through memoranda and working papers) is important. In addition, feedback provided at the tax audit level typically is delayed substantially and is infrequently provided.

3.3 Implications

The previous discussion indicates that experiential learning is affected by a variety of factors including breadth of experience, knowledge transferability and, most importantly, the nature and availability of feedback. While there inevitably will be variability across public accounting tasks (e.g., marketing versus judging materiality), for tasks which researchers have examined in the past, feedback is, at best, irregular and incomplete. Further, such feedback is usually process oriented, delayed, and is rarely decisive with respect to the existence and cause of poor judgments/decisions. Two implications follow regarding feedback in public accountancy settings. First, from the above discussion, given that such feedback is primarily process oriented, it is more likely to lead to process notions of expert performance such as justifiability/defensibility than to outcome notions examined traditionally by accounting researchers (e.g., see Gibbins and Emby [1985]).⁵

Second, because of the emphasis on judgment/decision justifiability and defensibility, experience is a suspect surrogate for expertise and expert performance as traditionally defined by accounting researchers. This second implication is particularly important because of a tendency in the accounting literature to use general experience in an activity as an expertise surrogate. Such "familiarity" often is quite distinct from expertise and expert performance (see Alba and Hutchinson [1987]). Stated another way, repeated personal encounters with or performance of a particular activity over time does not necessarily provide one with the level of knowledge and skill necessary for expert performance.

Despite the lack of feedback for tasks usually appearing in accounting experience/expertise studies, it might be argued that the surrogation of expertise (or expert

performance) by experience is appropriate, because of competitive forces. That is, it could be that experience is an adequate surrogate for expert performance because nonexperts will not survive in competitive environments. But, because of the variety of tasks performed and effectiveness referents adopted, there really is no reason to believe that suppliers of accounting services effectively cull out all but those whose technical judgment/decision performance is expert. Admittedly, however, economic forces are likely to ensure that those who are retained have achieved some minimum level of judgment/decision competency. Nevertheless, while some accountants may prosper because of their technical judgment/decision expertise, others will be retained and promoted based on other skills such as the aforementioned ability to efficiently make justifiable/defensible judgments or because of their prowess at attracting and retaining clients. In public accounting firms, therefore, experience (or longevity) is more likely to be associated directly with the judgment/decision attributes such as justifiability/defensibility than with those attributes of expert performance considered in most prior research studies. Given this observation, many of the inconsistencies in behavioral studies noted by Bédard [1989] and others may be attributable to the inappropriate use of experience as a surrogate.

4.0 PRESCRIPTIONS

Two primary conclusions are supported by the preceding discussion. First, while the recent trend in accounting research has tended toward the adoption of cognitive notions of expertise, it is important not to lose sight of the importance of expert performance.

Frederick and Libby [1986] represent one such attempt to link cognitive and performance-

based notions of expertise. Second, experience is unlikely to be a sufficient surrogate for expertise and expert judgment/decision performance in many public-accounting tasks typically examined by accounting researchers.⁹ Four prescriptions arise from the commentary that led to these conclusions.

First, research should, as an ultimate objective, develop an understanding of how and to what extent cognitive differences lead to differences in performance. For example, as we learn about the domain-specific knowledge possessed by expert accountants and how they organize this knowledge, expertise researchers will have at their disposal the ability to "bootstrap" by using measures of domain-specific knowledge and its organization as a new expertise surrogate. Researchers in the future, therefore, might employ their own domain-specific knowledge to identify auditors who have organized their knowledge about financial statement errors in a potentially useful fashion and then determine to what extent such "experts" exhibit expert performance (e.g., the extent to which configural information processing is employed when evaluating audit evidence; see Brown and Solomon [1989]). Similarly, while in the past the results of free-recall tasks (e.g., Weber [1980]) might have been reported as a dependent variable in studies, future research might measure characteristics of free recall as a means of placing subjects into different (expert and non-expert) independent variable levels and subsequently, measure the extent of expert performance for each group. Such an approach would begin to tie together the cognitive science and behavioral decision theory streams of expertise research (see Johnson [1988]). Behavioral accounting researchers' domain-specific knowledge is not only especially useful for the development of such innovative expertise measures but also may be recognized as

such researchers' comparative advantage in conducting scientific inquiries into expertise effects.

Second, designing experimental tasks for examining expertise (or expert performance) is of crucial import (see Bonner [1988]). That is, experimental tasks must be rich enough to differentiate experts through use of their domain-specific knowledge. For example, one would not expect the knowledge possessed by experts to differ greatly from that possessed by students in a task such as evaluating a manual payroll control system. This topic is commonly covered in the classroom and relatively little additional benefit is provided through experience. However, experts are more likely to possess important domain-specific knowledge regarding such issues as error frequency judgments (to the extent errors are observed) and how inherent risk is affected by client-specific attributes.

We have argued in this paper that, for many technical judgment/decision making tasks performed by accountants, there is limited availability of feedback regarding accuracy and similar effectiveness referents. However, at the same time, we observe that some individuals seem to achieve some level of expert performance. For example, it is common in public accounting firms to designate firm-wide technical experts or specialists. Our third prescription, therefore, is that future research should address questions like--What elements of the accounting environment and what aspects of individuals allow for development of expertise and expert performance in settings in which outcome feedback is not readily available?

Another implication of our discussion relates to the abundance of feedback in tasks not commonly examined in accounting research (e.g., attracting and retaining clients,

making justifiable and defensible judgments/decisions, etc.). In such tasks, given the regularity and appropriateness of feedback provided, experience could serve as an adequate surrogate for expertise. When, however, experience is adopted as a surrogate, certain difficulties encountered in past studies should be avoided. For example, as observed both by Choo [1989] and Coibert [1989], there have been vast differences as to how a person who has achieved a given level of longevity is classified. In various studies, "experienced" subjects might be defined variously as those employed in a CPA firm, those with over 3 years of experience, or those who have reached the rank of partner. In addition to the diversity in adopted definitions, almost all of the studies seem to use very coarse measures, either in terms of years of experience or in terms of rank within a firm.

Another difficulty associated with past attempts to use experience as a surrogate for expertise arose from the tendency to ignore the importance of both the nature of experiences [Bédard, 1989] and the goals of the research when selecting measures of experience. For example, one might expect that public accountants' independence perceptions would be a function of their personal experience with independence-related issues (see Farmer, Rittenberg, Trompeter [1987]). That is, when expertise is surrogated for by experience, task-specific experience is more important than tenure as an accountant. As an illustration, one would expect the expertise of audit partners in documenting internal control judgments not to differ significantly from that of seniors, and in fact, due to forgetting, partners may have less available knowledge for that task. The impact of experience on performance, therefore, might be shaped like an inverted "U," similar to the results reported in Ashton [1988]. In these situations, expertise would be poorly

represented by coarse measures of experience (e.g., years with the firm). Consequently, the preferred approach would be to consider the recency of experience, the nature of the experiences, and when applicable, the amount of time spent in one's career (in months or hours) performing the specific task (see Messier and Tubbs [1989]).

4.1 Concluding Remarks

Based on the earlier discussion of experience, expertise, expert performance, and characteristics of public accounting contexts which affect experiential learning within those contexts, we have presented four recommendations for future experience/expertise studies. It is our hope that these prescriptions will impact the treatment of experience/expertise within the accounting literature. Such new treatment, we trust, will produce fresh insights into experience/expertise effects in public accounting.

Endnotes

1. Noteworthy is that expertise is not a dichotomous concept but present in varying degrees in individuals. Similarly, as used herein, expert performance is a matter of degree.
2. Hindsight-effects studies demonstrate that the availability of outcomes for appraising judgments/decisions can be a double-edged sword (see Brown and Solomon [1987]). In addition, the usefulness of outcomes for appraising judgments/decisions depends upon several factors including the amount of time between the action and the outcome and outcome specificity. Lastly, when only "incomplete" outcomes are available (even if timely and specific), "Outcome Irrelevant Learning Structures" could result in such outcomes being harmful to learning and expert performance [Einhorn and Hogarth, 1978; Brehmer, 1980; Einhorn, 1980a, 1980b]. As an example, Einhorn [1980b] discusses evidence indicating that medical doctors' overconfidence increases as they obtain more experience.
3. Normative models sometimes have been used as a benchmark for assessing judgment and decision quality (e.g., the heuristics and biases literature [Bédard, 1989]). The validity of such models in public accountancy settings, however, has been called into question [Waller and Jambalvo, 1982]. Given the questionable validity of normative models in some accounting settings, we distinguish the notion of defensibility/justifiability from normative benchmarks.
4. Since relatively little is known about the factors that affect progression from the associative to autonomous stage and within the autonomous stage, the ensuing subsections focus on progression from the cognitive to the associative stage and within the associative stage.
5. We are aware of the literature on process feedback (see Ashton [1982, p. 32]) and we recognize that this feedback plays an important role in public accounting. However, the point still remains that without outcome feedback, experience may not necessarily lead to expert performance using referents commonly adopted by accounting researchers.
6. Evidence regarding this contention might be provided through longitudinal studies of expertise development in public accounting tasks. Such studies could provide important evidence on many of the issues addressed in this paper.

Exhibit 1: Feedback in Accountancy Settings

Feedback Source	Timing	Type	Focal Points
EXTERNAL AUDITS:			
Results of Direct and Related Tests	Concurrent	Outcome	Evidence produced by procedures.
Review Process	Concurrent	Process	Compliance with CPA-Firm and Professional Standards (Justifiability/Defensibility)
Cold-Partner Review	Near End of Engagement	Process	Compliance with CPA-Firm and Professional Standards (Justifiability/Defensibility)
TAX COMPLIANCE AND PLANNING:			
Review of Research Memorandum	Concurrent	Process	Defensibility of Recommendations, Thoroughness of Research Procedures, Clarity of Writing.
Review of Tax Return and Related Working Papers	Concurrent for Return. Some Delay for Research	Process	Compliance with IRS requirements, defensibility of reporting positions, and planning opportunities.
Tax Agency Review/Audit	Within 3 Years of Filing Date	Outcome	Defensibility and congruence with IRS position.
AUDIT AND TAX			
In-House and Peer Review	Within 1 to 2 Years of Engagement	Process	Compliance with CPA-Firm and Professional Standards (Justifiability/Defensibility)
Judicial	Beyond 2 Years of Engagement Completion or Filing Date	Outcome	Outcomes Resulting in Alleged Audit Failure or Judge's Opinion Regarding the Adopted Tax Reporting Position (Justifiability/Defensibility Still Important)

REFERENCES

- Alba, J., and W. Hutchinson. 1987. Dimensions of consumer expertise. Journal of Consumer Research (March): 411-454.
- Anderson, J. 1982. Acquisition of a cognitive skill. Psychological Review: 396-406.
- Anderson, J. 1985. Cognitive Psychology and Its Implications, Second Edition. New York: W. H. Freeman and Company.
- Anderson, J. 1987. Skill acquisition: Compilation of weak-method problem solutions. Psychological Review: 192-210.
- Anzai, Y., and H. Simon. 1979. The theory of learning by doing. Psychological Review: 124-140.
- Ashton, R. 1982. Human Information Processing in Accounting: Studies in Accounting Research # 17. Sarasota FL: American Accounting Association.
- Ashton, A. 1988. Audit expertise: The relation between error frequency knowledge and experience. Working paper.
- Ashton, R., D. Kleinmuntz, J. Sullivan, and L. Tomassini. 1988. Audit decision making. In Research Opportunities in Auditing: The Second Decade, edited by A. R. Abdelkhalik and I. Solomon, 95-132. Sarasota, FL: American Accounting Association--Auditing Section.
- Bédard, J. 1989. Expertise in auditing: Myth or reality? Accounting, Organizations and Society: 113-132.
- Billman, D., and E. Heit. 1988. Observational learning from internal feedback: A simulation of an adaptive learning method. Cognitive Science: 587-625.
- Bonner, S. 1988. Experience effects in auditing: The role of task-specific knowledge. Working paper.
- Brehmer, B. 1980. In one word: Not from experience. Acta Psychologica: 223-241.
- Brown, C., and I. Solomon. 1987. Effects of outcome information on evaluations of managerial decisions. The Accounting Review (July): 564-577.
- Brown, C., and I. Solomon. 1989. Configural information processing in audit evidence evaluation. Working paper.

- Butt, J. 1988. Frequency judgments in an audit-related task. Journal of Accounting Research (Autumn): 315-330.
- Chi, M., R. Glaser, and E. Rees. 1982. Expertise in problem solving. In Advances in the Psychology of Human Intelligence, Volume 1, edited by R. J. Sternberg, 7-75. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Choo, F. 1989. Expert-novice differences in judgment/decision making research. Journal of Accounting Literature: this volume.
- Colbert, J. 1989. The effect of experience in auditors' judgments. Journal of Accounting Literature: this volume.
- Einhorn, H. 1980a. Learning from experience and suboptimal rules in decision making. In Cognitive Processes in Choice and Decision Behavior, edited by T. S. Wallsten, 1-20. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Einhorn, H. 1980b. Overconfidence in judgment. In New Directions for Methodology of Behavioral Research: Fallible Judgement in Behavioral Research, edited by R. Shweder and D. Fiske. San Francisco: Jossey-Bass.
- Einhorn, H., and R. Hogarth. 1978. Confidence in judgment: Persistence of the illusion of validity. Psychological Review: 395-416.
- Farmer, T., L. Rittenberg, and G. Trompeter. 1987. An investigation of the impact of economic and organizational factors on auditor independence. Auditing: A Journal of Practice and Theory (Fall): 1-14.
- Frederick, D., and R. Libby. 1986. Expertise and auditors' judgments of conjunctive events. Journal of Accounting Research (Autumn): 270-90.
- Gibbins, M. 1988. Knowledge structures and experienced auditor judgment. In Auditor Productivity in the Year 2000: 1987 Proceedings from the Eleventh Arthur Young Professors' Roundtable, edited by A. Bailey, 51-70. Reston, VA: The Council of Arthur Young Professors.
- Gibbins, M., and C. Emby. 1985. Evidence on the nature of professional judgment in public accounting. In Auditing Research Symposium, edited by A. R. Abdel-khalik and I. Solomon, 181-212. Urbana-Champaign, IL: Office of Accounting Research, University of Illinois at Urbana-Champaign.
- Hintzman, D., G. Nozawa, and M. Irmscher. 1982. Frequency as a nonpropositional attribute of memory. Journal of Verbal Learning and Verbal Behavior: 127-141.

- Hoch, S., and G. Loewenstein. 1988. Outcome feedback: Hindsight and information. Working paper.
- Holland, J., K. Holyoak, R. Nisbett, and Thagard. 1987. Induction: Processes of Inference, Learning, and Discovery. Cambridge, MA: The MIT Press.
- Jacoby, J., T. Troutman, A. Kuss, and D. Mazursky. 1984. Experience and expertise in complex decision making, Advances in Consumer Research: 469-472.
- Johnson, E. 1988. Expertise and decision under uncertainty: Performance and process. In The Nature of Expertise, edited by M. Chi, R. Glaser, and M. Farr, 209-228. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Larkin, J. 1981. Enriching formal knowledge: A model for learning to solve textbook problems. In Cognitive Skills and Their Acquisition, edited by J. Anderson, 311-334. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Lewis, M., and J. Anderson. 1985. Discrimination of operator schemata in problem solving. Cognitive Psychology: 26-65.
- Medin, D., and M. Schaffer. 1978. Context theory of classification learning. Psychological Review: 207-238.
- Messier, W., and R. Tubbs. 1989. Mitigating recency effects in belief revision: The impact of experience and review. Working paper.
- Rumelhart, D., and A. Ortony. 1976. The representation of knowledge in memory. In Schooling and the Acquisition of Knowledge, edited by R. Anderson, J. Spiro, and N. Montague. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Simon, D., and H. Simon. 1978. Individual differences in solving physics problems. In Children's Thinking: What Develops?, edited by R. Siegler. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Singley, K., and J. Anderson. 1985. The transfer of text-editing skill. International Journal of Man-Machine Studies.
- Solomon, I. 1987. Multi-auditor judgment/decision making research. Journal of Accounting Literature: 1-25.
- Waller, W., and W. Felix. 1984. The auditor and learning from experience: Some conjectures. Accounting, Organizations and Society: 383-406.
- Waller, W., and J. Jiambalvo. 1984. The use of normative models in human information processing research in accounting. Journal of Accounting Literature: 201-216.

Weber, R. 1980. Some characteristics of the free recall of computer controls by edp auditors. Journal of Accounting Research (Spring): 214-241.





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