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Author(s): Cynthia Jeffrey

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The Relation of Judgment, Personal Involvement, and Experience in the Audit of Bank Loans

Cynthia Jeffrey
Iowa State University

SYNOPSIS AND INTRODUCTION: The quality of bank portfolios has declined in recent times, and allegations have been made that auditors have failed to detect material overstatements of the value of bank loan portfolios (McCoy et al. 1990; Thomas and Ricks 1990), lawsuits have sought to hold auditors liable for the misleading financial statements (Bailey 1987; Finn 1984), and audit firms have been censured by the SEC for improper professional conduct in the audits of banks (Grisdela and Berton 1987).

This research examines the evaluation of the bank loan portfolio, a critical and high-risk component of the audit of banks. The Allowance for Credit Losses "should be adequate to cover specifically identified loans, as well as loans and pools of loans for which losses are probable but not identifiable on a specific loan-by-loan basis" (AICPA 1986, 3).

The focus of this research is the effect of participation in sequential audits on auditors' loan evaluation judgments. The sequential nature of audit judgments is an important consideration, but previous research has considered only the sequential nature of individual audit tasks (see, e.g., Ashton and Ashton 1988; Cushing and Loebbecke 1986; Gibbins 1984). To date, research has not focused on the fact that audits themselves are sequential; most audits are repeat engagements, and the same auditors participate in the audit year after year.

A theoretical framework for the effect of personal involvement on judgment (Kiesler 1971; Staw 1976; Staw and Ross 1987) suggests that personal involvement fosters commitment and an escalation of commitment occurs when there is personal responsibility for a series of judgments.

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The current research extends previous studies by evaluating the effect of personal responsibility in a professional environment with experienced subjects performing a realistic task.

The literature suggests that experience could significantly affect the tendency of subjects to escalate their commitment to a chosen course of action. Experience is expected to improve judgments when (1) the decision maker is exposed to a variety of exemplars so that information about relative frequencies is learned, (2) the task is sufficiently complex and is either semistructured or unstructured, and (3) feedback on decisions is available. These conditions are all present for loan riskiness evaluations by auditors.

Previous research results also indicate that experience may improve judgments by mitigating the effect of cognitive heuristics on judgments (see, e.g., Libby et al. 1985; Shields et al. 1987). Mechanisms leading to these results include (1) improved probabilistic reasoning as a function of experience, (2) incentives to learn decision rules with accountability for judgments, and (3) sensitivity to evidence. Ashton and Ashton (1988, 1990) indicate that experienced auditors are particularly sensitive to evidence.

Like many other audit decisions, loan evaluation involves sequential judgments. The research reported here seeks to determine (1) whether personal involvement in sequential audits leads to an escalation of commitment to previous loan evaluation decisions and (2) whether experience in the audit environment diminishes or eliminates any negative consequences of personal responsibility. Personal involvement is manipulated across two groups of independent auditors, and audit experience and loan evaluation judgments are elicited. It is hypothesized that the interaction between personal involvement and experience affects the loan evaluation judgment. When there is a high level of personal involvement, the loan evaluation judgments of inexperienced auditors are predicted to be more favorable than those of experienced auditors; when there is a low level of personal involvement, no differences between the judgments of experienced and inexperienced auditors are predicted.

Based on experimentation with 41 auditors, the results indicate that a significant interaction does exist. Escalation behavior in loan evaluation judgments was evident in the evaluations of inexperienced auditors; experience mitigates the escalation effect.

Key Words: *Escalation of commitment, Experience, Loan evaluation, Bank audits.*

Data Availability: *Data are available from the author on request.*

IN the remainder of this article, section I covers the theoretical and hypothesis development. The experiment is described in section II. Finally, section III provides concluding remarks and a brief discussion.

I. Theoretical Development and Hypothesis

Overall Effects of Personal Involvement on Judgments

Personal involvement in the decision process can have both positive and negative effects on judgments. Positive effects may result because personal involvement increases task-specific experience and knowledge. An important type of knowledge gained from experience is knowledge of the relative frequencies of events (see Hock and Hasher 1990 for a review). Increased familiarity generally results in better performance by improving one's ability both to (1) isolate the information that is most important and task-relevant and (2) analyze the information (Alba and Hutchinson 1987). In the audit of loans, personal involvement in the decision process should provide auditors with information about the relative frequency of troubled loans in a portfolio and enable them to identify and evaluate factors that threaten loan collectibility.

Personal involvement has negative consequences for the decision process when overconfidence in knowledge, ability, and judgments results from increased involvement (Oskamp 1982); in auditing, overconfidence may lead to less thorough reviews. Personal involvement also may lead to commitment, which is defined as "the binding of the individual to behavioral acts. . . . The effect of commitment is to make an act less changeable" (Kiesler and Sakumura 1966, 349). Commitment also makes "the cognition representing the behavior more resistant to change" (Kiesler 1971, 31). There is evidence that people will act in an particular way merely as a consequence of having previously acted in the same manner (Salancik 1977); furthermore, as the number of acts increases, commitment often escalates (Kiesler 1971; see also Staw and Ross 1978 for a review). In the audit of bank loans, personal involvement in sequential loan evaluations may encourage auditors to make a judgment of loan collectibility that is consistent with their previous judgments. To the extent that an escalation of commitment fosters biased judgments, the effect of personal involvement in the decision process is negative.

Escalation of Commitment

Kiesler (1971, 33) suggests that commitment is increased, or escalates, with (1) the explicitness of the act, (2) the irrevocability of the act, (3) the act's importance for the subject, (4) the freedom of choice perceived by the decision maker, and (5) the number of acts performed. In the audit environment, loan evaluation judgments are documented in the working papers and are therefore explicit and irrevocable. Further, auditors at all levels agree that the evaluation of loans is an important part of the bank audit. Auditors are expected to use their best judgment when evaluating these loans, and so have freedom of choice in arriving at their loan evaluation judgments. Finally, current audit practice is characterized by a large number of repeat audit engagements and by a degree of continuity in audit team personnel over time.

In a given audit, it is common for at least some members of the audit team to have been personally involved in the prior year's audit, and these auditors may become committed to their previous judgments. To the extent that relevant information is recorded in the working papers, auditors with no prior involvement but with access to the prior year's working papers possess the same information as those with prior involvement. The key difference lies in whether the initial evaluations were self-generated or were made by a different auditor.

Little research has attempted to determine the underlying mechanisms whereby an escalation of commitment influences judgments. One possibility is that decision makers process information differently when initial judgments were self-generated. Libby and Trotman (1991) present results that the attention and relative recall of information by auditors engaged in sequential decision making is biased in the direction of facts that are supportive of, or consistent with, their initial judgments. Tan (1991) demonstrated that auditors paid differential attention to evidence consistent with their prior decisions. Church (1991) demonstrated that auditors committed to a hypothesis regarding the source of an error allocated more time to investigate that source. Differential use of information may explain the effects of commitment on judgment.

Decision makers who expect to justify their decisions may be motivated to demonstrate consistency in judgment (Hagafors and Brehmer 1983), which would encourage escalation behavior. In accounting, there is some evidence that prior involvement with an audit client creates social pressures or incentives to remain consistent in judgments across time. Auditors have been shown to underestimate the seriousness of a malfunction in the internal control system when they had previously evaluated the system (Plumlee 1985).

Kanodia et al. (1989) suggest that the escalation effect may be explained by economic factors. Specifically, there may be incentives for a decision maker not to reveal private information about negative outcomes. When a decision maker changes a prior decision, one interpretation is that the original decision was flawed. Because inconsistencies between current and prior decisions may reveal information about the quality of prior decisions that could affect the decision maker's reputation, the decision maker may be reluctant to make a decision that varies significantly from a previous one. In a loan evaluation context, changes in judgments over time may reflect inadequate performance in the past. Loan evaluation judgments are clearly documented in the working papers, and evaluations that indicate deteriorating loan quality are likely to be noticed and to require justification. Previous involvement in the loan evaluation process may induce a tendency to make subsequent decisions conform to a prior evaluation.

Research on Escalation of Commitment

Staw (1976) presents results consistent with the five determinants of escalating commitment posited by Kiesler (1971). Staw tested the hypothesis that effects of escalating commitment on judgments would occur as a function of the level of personal responsibility. Personal responsibility as defined by Staw encompasses the first four items identified by Kiesler; namely, explicitness and irrevocability of the act, the act's importance for the subject, and the freedom of choice perceived by the decision maker. Kiesler's fifth determinant, the number of acts performed, is used by Staw to differentiate between judges with high personal responsibility, that is, those making two or more sequential decisions, and those with low personal responsibility, who are making only a single decision.

Staw also posited that effects of escalating commitment on judgment would occur as a function of decision outcomes. He defined a positive outcome as one in which the results of a previous decision meet expectations; conversely, a negative outcome is one in which the results of a previous decision fail to meet expectations. On the basis of his results, Staw concluded that decision makers who have personal responsibility for

action choices that result in negative outcomes make subsequent choices that are more favorable to their previously chosen course of action than do individuals with no personal responsibility for previous action choices.

Studies on escalation of commitment consistently document the existence of this effect (see Staw and Ross 1987 for a review). These studies have focused on escalation behavior conditioned on negative outcomes. The strength of the results suggests that negative outcomes are a determinant of escalation behavior; additionally, increasing commitment with negative outcomes is potentially a more serious problem than increasing commitment when positive outcomes are achieved. Although numerous studies on escalation behavior indicate the possible existence of a large number of determinants of this effect and of possible moderating variables, Staw and Ross (1987, 65) state, "To date, the only findings approaching established status are those from project determinants manipulating obvious cost/benefit factors and from replications of the effects of personal responsibility. Our confidence in other determinants relies either on single studies or on validation from related social science literature."¹

In summary, the review of the research on escalation of commitment suggests that auditors may be susceptible to escalation behavior and that it is most likely to occur when (1) sequential evaluations about a course of action are made, (2) the decision maker has personal responsibility for a previous favorable decision, and (3) the outcome is negative; that is, the results of the chosen course of action do not live up to prior expectations. Although other determinants have been hypothesized and tested, the results for these factors are robust.

Escalation of Commitment and the Audit Environment

Discussions with the partner-in-charge of a large midwestern office of the Big 6 firm that participated in the experiment provided a description of auditor loan evaluation judgments. These discussions were used to determine *ex ante* the existence in the audit environment of sequential evaluations, personal responsibility, and negative outcome.²

Sequential evaluations are the norm. A bank is likely to retain the same audit firm annually. Although competition for clients is intense among large audit firms, it is very unusual for a large bank to change auditors.

Personal responsibility for sequential judgments results because continuity in audit team personnel is a goal of the audit firm. Auditors are likely to participate in sequential audits of individual clients, and the same auditor is likely to evaluate the loans in the bank's portfolio in consecutive years.

Escalation behavior in loan evaluations is most likely to occur if a deteriorating loan in the bank portfolio is perceived as a negative outcome by the auditor. The partner-in-charge stated that the audit firm is concerned with detecting troubled credits and with determining a fair representation of the Allowance for Credit Losses, but it is not a positive outcome when an auditor detects a troubled loan that has not been previously identified as such. The detection of a troubled credit may signal a need for

¹ Three independent lines of research on commitment in escalation situations have evolved from the study by Staw (1976). Results presented by Teger (1980), by Brockner and his associates (Brockner et al. 1987, 1986; Brockner and Rubin 1985), and by Staw and his associates (Staw and Ross 1980; Staw and Fox 1977) consistently document the existence of escalation behavior.

² The descriptions of loan evaluation judgments in this study are specific to this particular audit firm and generalize to other audit firms only to the extent that these audit practices are similar across firms.

increased audit work, and this may affect the profitability of the audit because the additional time required may not be billable. In addition, there may be some difficult meetings with the client if the detection of additional troubled credits leads the audit firm to require larger charges to the Allowance for Credit Losses and the Bad Debt Expense than had previously been anticipated. Disagreement with the client about the need for adjustment may strain the client relationship. The attitude expressed by the partner may be exacerbated by strong pressures on audit firm profitability and a sharp rise in competition among audit firms³ (Berton 1991). To the extent that detection of deteriorating loans is not perceived as a negative outcome by individual auditors, escalation behavior is less likely and the likelihood of finding significant results is reduced.

Role of Experience

Experience and the Loan Evaluation Judgment. Research in psychology has demonstrated that a person with more experience in a substantive area has more items in memory (Hayes-Roth and Hayes-Roth 1975; Hutchinson 1983; Murphy and Wright 1984) and develops a good understanding about the relative frequency of events (Hock and Hasher 1990). Further, increased experience results in a more complicated category structure (Weber and Crocker 1983).

These results have been replicated in a professional audit environment. Experienced auditors make better relative frequency judgments in professional tasks than do inexperienced ones (Butt 1988). Experienced auditors also are better able to identify errors in analytical review (Marchant 1989), exhibit more complete knowledge of financial statement errors, and generate a greater quantity of accurate explanatory hypotheses (Libby and Frederick 1991). They also generate more plausible and fewer implausible explanations for errors in the financial accounts, and are able to categorize errors based on the audit objective and the structure of the underlying accounting system (Libby et al. 1988). Tubbs (1990) demonstrated that as auditors become more experienced, (1) they become aware of more errors, (2) they have fewer misunderstandings about errors, (3) they become aware of more atypical errors, and (4) the causally related features of errors, such as department in which the error occurred and the internal control objective violated, become relatively more salient.

Experience is expected to have the greatest effect on judgment when the task is ill-structured and complex (Abdolmohammadi and Wright 1987) and when feedback is available (Hoch and Loewenstein 1989). Professionals uniformly agree that loan evaluation is a complex, ill-structured task that requires subjective professional judgment, so experience in this domain can be expected to influence judgment. Feedback is also available. Loan evaluations are reviewed all the way up to the partner level; the review process monitors both the quality of the work performed and its conformance with professional and firm standards (AICPA 1979) and provides feedback to auditors. Additional feedback is available to auditors who evaluate the same loan portfolio over a period of years.

³ Questions may arise about whether identifying a loan as troubled is a negative outcome for an auditor or whether an auditor might think that this would demonstrate technical competence and therefore be rewarded. Preliminary research (Holt and Jeffrey 1992) indicates that finding a material misstatement is perceived as significantly less important for career advancement than servicing the needs of an existing client ($p=0.002$). Detecting troubled credits is indeed important for the effectiveness of the audit; nevertheless, it is still considered a negative outcome for the audit firm.

In loan review, auditors are likely to review many loans in the course of even a single audit. Auditors are therefore exposed to extensive and varied loan information and are likely to have developed significant knowledge about categories of collectible and uncollectible loans, the features associated with these loans, and the relative frequency of collectible and uncollectible loans. Knowledge gained from experience therefore has the potential to affect loan evaluation judgments.

Experience and Escalation of Commitment. There are no published studies to date on the role of experience in escalation behavior, but research results indicate that increased experience may mitigate biases in judgment. Experience has been found to mitigate cognitive heuristics in a number of studies (Joyce and Biddle 1981a, 1981b; Kinney and Uecker 1982; Libby et al. 1985; Shields et al. 1987). Nisbett et al. (1983) found that experience allows judges to recognize heterogeneity of events and to improve their probabilistic reasoning. Results in a series of studies by Tetlock and his colleagues (Tetlock 1983a, 1983b, 1985; Tetlock and Boettger 1989; Tetlock and Kim 1987) indicate that accountability for judgments leads to more complex thought, and that this increased complexity of thought confers resistance to well-known judgmental biases.

Auditors are accountable for their judgments to superiors in the firm, to the client, and to the outside users of financial statements. Results reported in the accounting literature tend to support the hypothesis that experience mitigates judgmental biases. Rodgers (1991) presents results that suggest that experience is a key to overcoming the anchoring bias. Anderson and Wright (1988) studied the influence of professional experience on the explanation effect and determined that novice, but not experienced, auditors exhibited the effect.⁴ Recency effects in data evaluation were more pronounced for inexperienced auditors than for experienced ones (Messier and Tubbs 1990), and inexperienced, but not experienced, auditors were adversely affected by irrelevant evidence (Bamber et al. 1991). Auditors also seem to be particularly responsive to evidence, especially to evidence that does not support a current belief (Ashton and Ashton 1988, 1990). Ashton and Ashton demonstrate that "important aspects of the education and training of auditors, and of the legal and professional environment in which they work, may be expected to distinguish their approach to evidence evaluation from that of other groups" (1990, 3).

To summarize, the conditions for escalation behavior are present in the audit environment. However, experience is expected to mitigate escalation behavior in loan evaluation judgments. These findings lead to the research hypothesis:

- H1: There is an interaction between experience, personal responsibility, and the loan evaluation judgment such that judgments of inexperienced auditors in the high personal responsibility condition will be more favorable than those of experienced auditors. In the low personal responsibility condition, there will be no difference in the judgments of inexperienced and experienced auditors.

II. The Experiment

Subjects

Forty-one independent auditors from a single Big 6 accounting firm participated in the experiment. Only auditors at the senior or higher level participated because firm

⁴ The explanation effect occurs when the generation of an explanation for an event increases the judged likelihood of the event.

policy requires that auditors be at least at the senior level before having responsibility for loan evaluation. All the auditors in the study normally spent 25 percent or more of their time working on audits of financial institutions, primarily banks. Auditors from four offices of the accounting firm participated in the study. There were no discernible differences in responses across the four offices, and at three of the four offices, there was 100 percent participation by qualified auditors. Auditors were randomly assigned to the experimental conditions (discussed below) with the constraint that cell sizes be approximately equal.

Materials

Auditors who participated in this study completed two experiments on loan evaluation, only one of which is reported here. Subjects were randomly assigned to participate in either experiment 1 or experiment 2 first, with the constraint that half participate in experiment 1 first. Because there were two experiments, it was necessary to test for order effects; there were no significant order effects ($p > 0.40$).

The experimental materials consisted of (1) an instruction set, (2) a short sample loan with a loan evaluation worksheet, (3) the Wilderness Resorts case, and (4) a post-experimental questionnaire. The instructions outlined the scope of the task and indicated that responses would be confidential and that the results would be reported in the aggregate. A sample loan evaluation case was then presented to ensure that everyone understood the task and the form the responses should take.

The Wilderness Resorts case was developed for this research and is a credit file for a loan. Included in the file are the name of the borrower, type of business, amount outstanding, interest rate, origination date, maturity date, purpose, security, loan officer diary sheets, and financial statements. To provide assurance that the case provided a realistic representation of a company with a *deteriorating* credit position, the case was based on the past three annual reports of an actual company whose bond rating had been recently downgraded by both *Value Line* and *Standard & Poor's*.⁵ The reasons for downgrading the debt cited by *Value Line* and *Standard & Poor's* were built into the case, but the size of company was reduced to insure that the debt could be financed by a single bank; the intent was to avoid the complexities of credit evaluations when multi-bank financing is used. In addition, the smaller company in the case would not be listed on a stock exchange, so auditors would not have information about how investment services would rate the company debt. The judgment of interest in the research is loan evaluation, not how auditors incorporate investment service information into these evaluations.

⁵ On the basis of 1985 financial information and projections for the first quarter of 1986, *Value Line* rated the actual company's long-term prospects as favorable as of March 31, 1986. By June 30, 1986, however, *Value Line* substantially revised this opinion and reported that prospects for the stock's future performance appeared to be poor. This is consistent with *Standard & Poor's* rating of the firm; on September 1, 1986, *Standard & Poor's* downgraded the debt from B to CCC-. Reasons cited by both *Value Line* and *Standard & Poor's* included a significant decrease in membership sales, which decreased by 47 percent from the prior year for the first six months of 1986. This was coupled with high operating costs, high marketing expenses, and a negative cash flow for the period. The decrease in membership sales was not seen as a temporary phenomenon, but was linked to (1) a general economic downturn that was responsible for a substantial reduction in recreational spending, (2) high gasoline prices, and (3) changes in marketing techniques in an attempt to reduce marketing costs. *Value Line* reported that it probably would be necessary for the company to sell some of its properties to maintain satisfactory working capital.

The post-experimental questionnaire elicited subjects' perceptions about the audit work environment and task realism. Personal information, including gender, educational background, and experience, was also collected.

Because half the subjects were told that the loan was clean (i.e., untroubled) as of February 1986, it is important that the loan actually be viewed as untroubled by professionals. The credit file was initially reviewed by four people: the partner-in-charge at the accounting firm, a senior vice-president at a major regional bank, the manager of the credit evaluation department at a major regional bank, and a federal bank examiner from the Office of the Comptroller of the Currency (OCC). All four evaluated the loan as untroubled as of February 1986. In addition, two senior managers from a major international audit firm worked through the materials under experimental conditions, and both evaluated the loan as good as of February 1986.

Procedures

At two of the four participating offices, the experiment was administered and controlled by the researcher. Auditors met in a conference room and spent approximately two hours completing the experiments. None of the 18 subjects who participated under these conditions had any unusual questions or expressed any difficulty in completing the experimental materials within the two hours allotted. At the remaining two offices, the secretary of the partner-in-charge administered the materials. There were no discernible differences between the responses in any of the groups of participants, and the partner-in-charge at each office personally requested the participation of the auditors. A summary of the results was promised to the partners and to the participants. Discussions with auditors after the experiment indicated a high level of interest in both the task and the results.

Operationalization of Variables

Personal responsibility is a categorical variable with two levels, high and low, and it was manipulated by varying the number of sequential judgments that subjects were required to make. Auditors in the high personal responsibility condition were asked to make two sequential decisions. These subjects were provided with a credit file complete through the end of 1985 and were asked to evaluate the loan as of February 1986. After making the initial judgment, the subjects received additional information that was added to the credit file during 1986, and they were asked to make a second loan evaluation as of February 1987.⁶ Auditors in the low personal responsibility condition were provided with the complete credit file through 1986, including the information that the loan was considered by the previous auditor to be a good loan (i.e., collectible) as of February 1986, and were asked to evaluate the loan as of February 1987. The operationalization of personal responsibility is consistent with the extant literature on escalation of commitment (see, e.g., Bazerman et al. 1980, 1984; Caldwell and O'Reilly 1982; Staw 1976).

The second variable of interest, experience, was not manipulated but was mea-

⁶ The constraints of a laboratory experiment prevented the researcher from using a real time line and delaying the second loan evaluation judgment for a year. However, auditors normally have their working papers from the previous year available when making subsequent evaluations. Working papers contain the loan judgment from the previous year, and serve to remind the auditor about the previous evaluation. Given the use of working papers, the two-hour time frame of this experiment is a reasonable surrogate for the decision-making process in the audit environment.

sured. Discussions with the auditors indicated that firm-specific experience was more important than general experience as an auditor because of differences across audit firms, and the formal training was an important component of auditor experience. Because in-house training programs in this firm are related to rank, because the nature of the task-specific experience changes with rank, and because all the auditors who participated in the experiment spent a large percentage of their time working on bank audits, rank within the firm was chosen as the appropriate operational variable for the analysis.

In this research, seniors in the firm are categorized as inexperienced because auditors do not begin to make loan evaluation judgments until they are seniors and undergo formal training in loan evaluation. The mean (s.d.) experience reported by the seniors was 2.80 (0.83) years with the firm. Thus, in this research seniors will be inexperienced.

Managers or senior managers in the firm are considered experienced auditors. The mean (s.d.) experience reported by the managers and senior managers was 7.67 (2.61) years. Auditors are promoted to manager after approximately four years with the firm, at which time they are expected to be able to make loan evaluation judgments and to evaluate the judgments of seniors. For the auditors who participated in this experiment, rank in the firm was perfectly correlated with years of experience. The hypothesis that there is no difference in experience between the group is rejected ($p < 0.001$).

Audit firm procedures require auditors to make a dollar estimate of the amount to be included in the Allowance for Credit Losses for each loan; therefore, the dollar estimate to be included in the allowance for the loan to Wilderness Resorts was elicited in the experiment. The dollar estimate was then partitioned into two levels, judgments that the loan was either good or troubled. According to the auditors at the firm, loans perceived as good credits are treated differently than ones perceived to be troubled because troubled loans threaten the value of the loan portfolio. Estimates that 10 percent or less of the loan should be allocated to the Allowance for Credit Losses were categorized as judgments that the loan was good; estimates in excess of 10 percent were categorized as judgments that the loan was troubled.

There were several reasons for choosing a cutoff level of 10 percent of the total loan. First, a materiality threshold of 5-10 percent is common in accounting. Second, a measure of asset quality commonly used (Meeker and Gray 1987; Spong and Hoenig 1979) is a weighted classification statistic based on bank examiner classification categories. The classification categories as cited by the AICPA (1986) are:

1. Unclassified, or current loans are judged to be within the limits of acceptable banking risk.
2. Special mention loans are loans in which there has been some deterioration in the borrower's financial position, but collection is still judged to be probable. Regulators identify these loans as potentially weak. Loans in this category are said to be "criticized"; loans in any of the more severe categories are said to be "classified."
3. Substandard loans are loans that involve more than a normal risk because of the financial condition or unfavorable record of the borrower, insufficiency of collateral, or other factors noted by the examiner.
4. Doubtful loans are credits for which the ultimate collection is unlikely and a substantial loss is likely, but the loss is not yet definitely estimable.
5. Loss loans are loans that are regarded as uncollectible and as estimated losses that should be written off against the bank's capital.

Future charge-offs are estimated as the sum of 20 percent of substandard credits, 50 percent of doubtful credits, and 100 percent of loss credits. The amount to be allocated to the Allowance for Credit Losses for unclassified loans should therefore be less than 20 percent.

In the experiment, subjects were asked to categorize the loan into bank examination classifications. The total dollar value of the loan, \$1 million, was assigned to categories ranging from 1 (good) to 5 (loss). A weighted-average classification rating was then calculated and used as the independent variable in a regression analysis. The dollar amount allocated to the Allowance for Credit Losses was the dependent variable. The relationship was significant ($p=0.05$), and the regression equation predicts that \$98,000 which is approximately 10 percent of the outstanding loan balance, will be allocated to the Allowance for Credit Losses for loans categorized as special mention (category 2).⁷

Manipulation Check

Comparison of the loan evaluation judgments for the second evaluation as of February 1987 was valid only if it was reasonable to believe that all subjects would evaluate the loan as good as of February 1986 (the first loan evaluation decision). The professionals who reviewed the materials prior to the experiment indicated that the loan was untroubled. Also, because half the subjects (those in the high personal responsibility condition) evaluated the loan as of February 1986, it was possible to determine how many of these subjects evaluated the loan as untroubled as of February 1986. Of the 21 subjects in the high personal responsibility condition, 20 made an initial evaluation that the loan was good. Of these 20, 14 made a point estimate of zero dollars to be allocated to the Allowance for Credit Losses for this loan, and an additional three subjects allocated less than 1 percent of the loan balance to the allowance. One subject allocated 5 percent of the outstanding balance, and two subjects allocated 10 percent to the Allowance for Credit Losses. The hypothesis that the point estimate was less than or equal to 10 percent of the total loan value could not be rejected at the 0.05 level of significance; the more conservative hypothesis that the point estimate was less than or equal to 5 percent of the total loan value also could not be rejected at the 0.05 level of significance. All 21 subjects indicated that the minimum amount acceptable to allocate to the Allowance for Credit Losses for this loan was zero dollars. Furthermore, ten subjects indicated the maximum amount to be allocated for this loan was zero, and an additional five subjects felt the maximum allocation for this loan would be 10 percent or less of the outstanding loan balance. That subjects would evaluate the loan as good as of February 1986 was therefore confirmed.

Because half the subjects were told that the loan was previously evaluated as a good loan, the reliability of the judge who made the previous evaluation judgment is impor-

⁷ According to the OCC, special mention credits are not classified. In a separate experiment (Jeffrey 1991), bankers were asked to evaluate the loan to Wilderness Resorts. Again, a regression was run with the loan evaluation judgment as the dependent variable and the weighted-average loan classification judgment as the independent variable. The relationship was significant ($p=0.004$), and the regression equation predicts a loan evaluation judgment of \$102,000 for banker subjects who classify the loan to Wilderness Resorts as special mention. Because both bankers and auditors allocated approximately 10 percent of the total loan balance to Wilderness Resorts when they classified this loan as special mention, this amount was used as the cutoff level for categorizing the loan as good; amounts greater than 10 percent are categorized as judgments that the loan is troubled.

tant. The auditors in the low personal responsibility condition were told that the previous evaluation was made by the audit team from the same firm that evaluated the loan the previous year. This meant that the evaluation judgment was subject to the normal firm review and quality control procedures. Discussions with the auditors indicated that, under these conditions, they believed the judgment was reliable.

Because the subjects evaluated the loan as a good credit on the first evaluation date, examination of the judgment on the second evaluation date revealed which subjects still considered the loan as good and which had changed their evaluation and now considered the loan as troubled. The subjects who evaluated the loan as good on the second evaluation date were making judgments similar to their initial evaluation; this behavior is consistent with escalation of commitment.

Participants were also asked to evaluate the realism of the Wilderness Resorts case on a scale that ranged from 0, not realistic, to 10, extremely realistic. The mean (s.d.) response was 7.68 (0.91). There were no responses below 6.

Statistical Analysis and Results

The hypothesis is tested with a multivariate analysis of categorical data by using a loglinear model (BMDP Program 4F). This statistical technique examines relations among the categorical variables and is the appropriate model for multivariate categorical variables (Fienberg 1983). Unlike MANOVA and ANOVA models that assess the effects of independent variables on dependent measures, loglinear models test the structural relations among categorical explanatory and response variables (Fienberg 1983, 3). In the research reported here, experience and personal responsibility are the explanatory variables, and the loan evaluation judgment is the response variable. Because all of these variables are operationalized as categorical variables, the optimal model to test the research hypothesis is the loglinear model.

Loglinear analysis consists of a special class of models termed hierarchical models. In a hierarchical model, if the interaction of a set of variables is significant, each lower order term also must be significant for all possible combinations of these variables. For a three-variable model, this means that if the three-way interaction term is significant, the lower order two-way interactions and the individual main effects are also significant. To describe a hierarchical model, it is sufficient to list the highest order term in which variables appear. This is called the generating class of a model (Norusis 1985, 308). When the highest order term is tested and determined to be significant, the interpretation is that the relation among the variables is significant; that is, the levels of any one variable differ as the remaining variables change. Conditional models are then used to identify the specific relations between the response variable and the explanatory variables.

The appropriate statistic to test a hypothesis with the loglinear model is the likelihood ratio (Berenson et al. 1983, 492). The likelihood ratio is additive under partitioning for nested models (Dixon et al. 1985). A significant three-way interaction therefore indicates that all nested models are also significant at the same or lower level of significance. If the likelihood ratio for a three-way interaction is significant, the significant two-way interactions should be examined. Conditional likelihood ratios are calculated for the two-way interaction; the interactions are tested by examining the relation between the two variables in an interaction conditioned on each level of the third variable. The significance level of the conditional likelihood ratios defines the form of the relationship.

Table 1
Experience by Loan Evaluation Judgment
Conditioned by Personal Responsibility

Panel A. Low Responsibility:		
	Inexperienced n = 13	Experienced n = 7
Good Loan	62%	71%
Troubled Loan	38%	29%
Panel B. High Responsibility:		
	Inexperienced n = 7	Experienced n = 14
Good Loan	100%	57%
Troubled Loan	0%	43%

The test of the research hypothesis is accomplished by testing for an interaction of personal responsibility, the loan evaluation judgment, and experience. A significant interaction indicates that the loan evaluation judgment is different for different combinations of the two explanatory variables, experience and personal responsibility. Analyses are performed on (1) the two-way interaction of the loan evaluation judgment and personal responsibility conditioned on each level of experience and (2) the two-way interaction for the loan evaluation judgment and experience conditioned on each level of personal responsibility. These analyses are used to specify the relation between each of the two explanatory variables, personal responsibility and experience, and the response variable, the loan evaluation judgment.

The null form of the hypothesis is that experience, personal responsibility, and the loan evaluation judgment are not related. The hypothesis of no relationship was rejected ($p < 0.03$), and it is assumed that there is a significant interaction of personal responsibility, the loan evaluation judgment, and experience. That is, different loan evaluation judgments are made as the levels of personal responsibility and experience vary.

The significant interaction indicates a significant main effect of personal responsibility, a significant main effect of experience, and that the lower order two-way interactions are significant. The lower order two-way interaction between the loan evaluation judgment and experience was analyzed by using models conditioned on each level of personal responsibility; models for the loan evaluation judgment and experience were generated for each level of personal responsibility. The results are presented in table 1.

For the low personal responsibility condition, the hypothesis that experience and the loan evaluation judgment are independent cannot be rejected ($p = 0.65$). For the high personal responsibility condition, however, the hypothesis of independence is rejected ($p = 0.01$), and a relation between experience and judgment is assumed when a decision maker has high personal responsibility for the judgment. As shown in table 1, 38 percent of the inexperienced subjects and 29 percent of the experienced subjects

Table 2
Personal Responsibility by Loan Evaluation Judgment
Conditioned by Experience

<i>Panel A. Experienced:</i>		
	<i>Low Responsibility n = 13</i>	<i>High Responsibility n = 7</i>
Good Loan	62%	100%
Troubled Loan	38%	0%
<i>Panel B. Inexperienced:</i>		
	<i>Low Responsibility n = 7</i>	<i>High Responsibility n = 14</i>
Good Loan	71%	57%
Troubled Loan	29%	43%

with low personal responsibility evaluated the loan as troubled. In other words, approximately the same proportion of inexperienced and experienced subjects evaluated the loan as troubled ($p=0.65$). This is in contrast to the results for high personal responsibility subjects, which show that none of the inexperienced subjects judged the loan to be troubled, although 43 percent of the experienced subjects did so. In the high personal responsibility condition, where the escalation bias is predicted to appear, inexperienced subjects evaluated the loan more favorably than experienced subjects ($p=0.01$).

The significant lower order two-way interaction between the loan evaluation judgment and personal responsibility was analyzed by using models conditioned on each level of experience, and these results appear in table 2. For the low experience condition, the hypothesis that the loan evaluation judgment and personal responsibility are independent is rejected ($p=0.02$); for inexperienced subjects, there is a significant interaction between these variables. For inexperienced auditors, 38 percent of those in the low personal responsibility condition evaluated the loan as troubled, but none in the high personal responsibility condition did so. This indicates escalation behavior in the loan evaluation judgments of the inexperienced subjects. In the high experience condition, however, the hypothesis that personal responsibility and the loan evaluation judgment are independent cannot be rejected ($p=0.5$); experienced subjects did not exhibit any escalation biases in their loan evaluation judgments.

III. Discussion and Conclusions

This research studied the loan evaluation judgments of auditors in a realistic professional setting and evaluated the influence of participation in sequential audits and experience in the loan evaluation environment on judgments. In particular, the results indicate that professional auditors may be susceptible to escalation behavior when making such judgments, but that experience may eliminate escalation behavior.

The experiment tested the importance of personal responsibility by considering the number of sequential judgments an auditor makes. Contingency table analysis with a loglinear model indicated a significant interaction between personal responsibility, experience, and the loan evaluation judgment. Inexperienced auditors making sequential decisions evaluated a deteriorating loan more favorably than did experienced auditors using identical information but making only a single judgment. In other words, inexperienced auditors exhibited escalation behavior in their loan evaluation judgments, but this effect was not apparent in the judgments of experienced auditors.

It is important to note that even though experience mitigates escalation behavior, overall only 38 percent of the experienced subjects and 25 percent of the inexperienced subjects evaluated the loan as troubled. A possible explanation for this result is that, although the case materials were designed to be very realistic and although subjects seemed to respond to the experimental task seriously, all the incentives for performance in a professional environment cannot be duplicated in an experiment. Because accountability is thought to encourage complexity of thought and improved judgments, the results may be biased against detecting the deterioration of the loan. Although the significant results indicate a strong relation among the loan evaluation judgment, personal responsibility for judgments, and experience, future research should attempt to discover reasons for the disparity in the judgments of the experienced auditors.

References

- Abdolmohammadi, M., and A. Wright. 1987. An examination of the effects of experience and task complexity on audit judgments. *The Accounting Review* 62 (January): 1–13.
- Alba, J., and J. Hutchinson. 1987. Dimensions of consumer expertise. *Journal of Consumer Research* 13 (March): 411–54.
- American Institute of Certified Public Accountants. 1979. *Statement on Quality Control Standards No. 1: Systems of Quality Control for a CPA Firm*. New York: AICPA.
- . 1986. *Auditing the Allowance for Credit Losses of Banks, Auditing Procedure Study*. New York: AICPA.
- Anderson, U., and W. F. Wright. 1988. Expertise and the explanation effect. *Organizational Behavior and Human Decision Processes* 42 (October): 250–69.
- Ashton, A. H., and R. H. Ashton. 1988. Sequential belief revision in auditing. *The Accounting Review* 63 (October): 623–41.
- , and ———. 1990. Evidence-responsiveness in professional judgment: Effects of positive versus negative evidence and presentation mode. *Organizational Behavior and Human Decision Processes* 46 (June): 1–19.
- Bailey, J. 1987. Continental Illinois ex-chief aids FDIC. *The Wall Street Journal* (April 1): 6.
- Bamber, E. M., R. M. Tubbs, G. Gaeth, and R. J. Ramsey. 1991. Characteristics of audit experience in belief revisions. Working paper, University of Georgia, Athens.
- Bazerman, M. H., F. D. Schoorman, and P. S. Goodman. 1980. A cognitive evaluation of escalation processes in managerial decision making. Paper presented at the annual meeting of the Academy of Management, Detroit.
- , T. Giuliano, and A. Appelman. 1984. Escalation of commitment in individual and group decision making. *Organizational Behavior and Human Performance* 33 (April): 141–52.
- Berenson, M. L., D. M. Levine, and M. Goldstein. 1983. *Intermediate Statistical Methods and Applications: A Computer Package Approach*. Englewood Cliffs, NJ: Prentice-Hall.
- Berton, L. 1991. The CPA jungle: Accounting profession, once a staid field, is torn by incivility. *The Wall Street Journal* (July 24): A1.
- Brockner, J., R. Houser, G. Birnbaum, K. Lloyd, J. Deitcher, S. Nathanson, and J. Rubin. 1986. Escalation of commitment to an ineffective course of action: The effect of feedback having negative implications for self-identity. *Administrative Science Quarterly* 31 (March): 109–26.

- , M. N. O'Malley, T. Hite, and D. Davies. 1987. Reward allocation and self-esteem: The roles of modeling and equity restoration. *Journal of Personality and Social Psychology* 52 (4): 844–50.
- , and J. Z. Rubin. 1985. *Entrapment in Escalating Conflicts*. New York: Springer-Verlag.
- Butt, J. 1988. Frequency judgments in an auditing-related task. *Journal of Accounting Research* 26 (Autumn): 315–29.
- Caldwell, D. F., and C. A. O'Reilly. 1982. Responses to failure: The effects of choice and responsibility on impression management. *Academy of Management Journal* 25 (March): 121–36.
- Church, B. K. 1991. An examination of the effect that commitment to a hypothesis has on auditors' evaluations of confirming and disconfirming evidence. *Contemporary Accounting Research* 7 (Spring): 513–32.
- Cushing, B. E., and J. K. Loebbecke. 1986. Comparison of audit methodologies of large accounting firms. In *Studies in Accounting Research* No. 26. Sarasota: AAA.
- Dixon, W. J. (Chief Editor), M. Brown, L. Engelman, J. Frane, M. Hill, R. Jennrich, and J. Toporek, eds. 1985. *BMDP Statistical Software*. Berkeley: University of California Press.
- Fienberg, S. E. 1983. *The Analysis of Cross-Classified Categorical Data*. Cambridge, MA: MIT Press.
- Finn, E. A., Jr. 1984. FDIC sues Peat Marwick for \$130 million over its audit of failed Penn Square Bank. *The Wall Street Journal* (December 13): 7.
- Gibbins, M. 1984. Propositions about the psychology of professional judgment in public accounting. *Journal of Accounting Research* 22 (Spring): 103–25.
- Grisdela, C., and L. Berton. 1987. KMG Main Hurdman censured by SEC for "improper" conduct in two audits. *The Wall Street Journal* (March 26): 40.
- Hagafors, R., and B. Brehmer. 1983. Does having to justify one's decisions change the nature of the judgment process? *Organizational Behavior and Human Performance* 31 (April): 223–32.
- Hayes-Roth, B., and R. Hayes-Roth. 1975. Plasticity in memorial networks. *Journal of Verbal Learning and Verbal Behavior* 14 (October): 506–22.
- Hoch, S. J., and G. F. Loewenstein. 1989. Outcome feedback: Hindsight and information. *Journal of Experimental Psychology: Learning, Memory, and Cognition* 15 (July): 605–19.
- Hock, S., and L. Hasher. 1990. Judgments of frequency: A tool for the analysis of memory. In *Event-Related Potentials of the Brain*, edited by J. W. Rohrbaugh, et al. New York: Oxford University Press.
- Holt, D., and C. Jeffrey. 1992. Professional commitment: The impact of professional career choice, tenure with the firm, and factors critical for advancement. Working paper, Iowa State University, Ames.
- Hutchinson, J. 1983. Expertise and the structure of free recall. In *Advances in Consumer Research*, edited by R. Bagozzi and A. Tybout, 585–89. Ann Arbor, MI: Association for Consumer Research.
- Jeffrey, C. 1991. Banker loan evaluation judgments: The impact of escalation of commitment and the impact of experience on judgments. Working paper, Iowa State University, Ames.
- Joyce, E. J., and G. C. Biddle. 1981a. Anchoring and adjustment in probabilistic inference in auditing. *Journal of Accounting Research* 19 (Spring): 120–45.
- , and ———. 1981b. Are auditors' judgments sufficiently regressive? *Journal of Accounting Research* 19 (Autumn): 323–49.
- Kanodia, C., R. Bushman, and J. Dickhaut. 1989. Escalation errors and the sunk cost effect: An explanation based on reputation and information asymmetries. *Journal of Accounting Research* 27 (Spring): 59–77.
- Kiesler, C. A. 1971. *The Psychology of Commitment*. New York: Academic Press.
- , and J. Sakumura. 1966. A test of a model for commitment. *Journal of Personality and Social Psychology* 3 (March): 349–53.
- Kinney, W. R., and W. C. Uecker. 1982. Mitigating the consequences of anchoring in auditor judgments. *The Accounting Review* 57 (January): 55–69.
- Libby, R., J. T. Artman, and J. J. Willingham. 1985. Process susceptibility, control risk, and audit planning. *The Accounting Review* 60 (April): 212–30.
- , and ———. 1991. Expertise and the ability to explain audit findings. Forthcoming in *Journal of Accounting Research*.
- , and K. Trotman. 1991. The review process as a control for differential recall of evidence in auditor judgments. Working paper, Cornell University, Ithaca, NY.

- Marchant, G. A. 1989. Analogical reasoning and hypothesis generation in auditing. *The Accounting Review* 64 (July): 500–13.
- McCoy, R., B. Schmitt, and J. Bailey. 1990. Hall of shame: Besides S&L owners, host of professionals paved way for crisis. *The Wall Street Journal* (November 2): A1.
- Meeker, L., and L. Gray. 1987. A note on non-performing loans as an indicator of asset quality. *Journal of Banking and Finance* 11 (1): 161–68.
- Messier, W. F., Jr., and R. M. Tubbs. 1990. Mitigating recency effects in belief revision: The impact of experience and review. Working paper, Fisher School of Accounting, University of Florida, Gainesville.
- Murphy, G. L., and J. C. Wright. 1984. Changes in conceptual structure with expertise: Differences between real-world experts and novices. *Journal of Experimental Psychology: Learning, Memory, and Cognition* 10 (January): 144–55.
- Nisbett, R. E., D. H. Krantz, C. Jepson, and Z. Kunda. 1983. The use of statistical heuristics in everyday inductive reasoning. *Psychological Review* 90 (October): 339–63.
- Norusis, M. J. 1985. *SPSS: Advanced Statistical Guide*. Chicago: McGraw-Hill.
- Oskamp, S. 1982. Overconfidence in case-study judgments. In *Judgment Under Uncertainty: Heuristics and Biases*, edited by Daniel Kahneman et al., pp. 287–93. Cambridge: Cambridge University Press.
- Plumlee, D. R. 1985. The standard of objectivity for internal auditors: Memory and bias effects. *Journal of Accounting Research* 23 (Autumn): 683–99.
- Rodgers, J. L. 1991. Ability of professionals to avoid the anchoring and adjustment bias through task familiarity and nonmonetary incentives. Working paper, North Carolina State University, Raleigh.
- Salancik, G. R. 1977. Commitment and the control of organizational behavior and belief. In *New Directions in Organizational Behavior*, edited by B. M. Staw and G. R. Salancik, 1–54. Chicago: St. Clair.
- Shields, M., I. Solomon, and W. S. Waller. 1987. Effects of alternative sample space representations on the accuracy of auditors' uncertainty judgments. *Accounting, Organizations, and Society* 12 (July): 375–85.
- Spong, K., and T. Hoenig. 1979. Bank examination classification and loan risk. *Economic Review of the Federal Reserve Bank of Kansas City* 64 (June): 15–25.
- Staw, B. 1976. Knee-deep in the big muddy: A study of escalating commitment to a chosen course of action. *Organizational Behavior and Human Performance* 16 (June): 27–44.
- , and F. Fox. 1977. Escalation: The determinants of commitment to a chosen course of action. *Human Relations* 30 (May): 431–50.
- , and J. Ross. 1978. Commitment to a policy decision: A multi-theoretical perspective. *Administrative Science Quarterly* 23 (March): 40–64.
- , and ———. 1980. Commitment in an experimenting society: A study of the attribution of leadership from administrative scenarios. *Journal of Applied Psychology* 65 (June): 249–60.
- , and ———. 1987. Behavior in escalation situations: Antecedents, prototypes, and solutions. In *Research in Organizational Behavior*, vol. 9, edited by L. L. Cummings and B. M. Staw, 39–78. Greenwich, CT: JAI Press.
- Tan, H. 1991. Effects of expectation and prior involvement on memory for audit evidence and judgment: The moderating role of accountability. Working paper, University of Michigan, Ann Arbor.
- Teger, A. I. 1980. *Too Much Invested to Quit*. New York: Pergamon Press.
- Tetlock, P. E. 1983a. Accountability and complexity of thought. *Journal of Personality and Social Psychology* 45 (July): 74–83.
- . 1983b. Accountability and the perseverance of first impressions. *Social Psychology Quarterly* 46 (December): 285–92.
- , and R. Boettger. 1989. Accountability: A social magnifier of the dilution effect. *Journal of Personality and Social Psychology* 57 (July): 388–98.
- , and J. J. Kim. 1987. Accountability and judgment processes in a personality prediction task. *Journal of Personality and Social Psychology* 52 (October): 700–09.
- Thomas, P., and T. Ricks. 1990. Tracing the billions: Just what happened to all that money savings & loans lost? *The Wall Street Journal* (November 3): A1.

- Tubbs, R. M. 1990. The effect of experience on the auditor's organization and amount of knowledge. Working paper, University of Iowa, Iowa City.
- Weber, R., and J. Crocker. 1983. Cognitive processes in the revision of stereotypic beliefs. *Journal of Personality and Social Psychology* 45 (November): 961–77.