Controlling Decision-Making Practice in Organizations

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Abstract

How are decision practices fostered in organizations and how are they linked to decision outcomes? This study addresses these questions by examining one financial institution's efforts to standardize and control decision making across geographically separated organizational units. We argue that decision-maker behavior is situated and is not simply a function of individual choice. Rather, in organizational settings decision-makers are subject to a hierarchy of influences that affect the decision processes they use and their resulting decision choices. To test our ideas, we examined 900 borrower "risk rating" decisions and found general support for our hypotheses. Decision makers were more likely to use the prescribed practice when decisions were important, when the decision target was known, and when the decision maker was located in a larger subunit. Decision makers altered their decision practices in the short term, but in the long term they appeared to partially revert to their earlier practices. Reliance on prescribed practice fostered stability in decisions, but surprisingly appeared to negatively affect future judgments. The findings indicate that organizations can change the more microaspects of decision making, but these changes may be transitory. Moreover the results suggest that decision makers may become complacent when they rely on prescribed decision practices, a tendency that can have untoward consequences for the organizations in which they are embedded.

(Decision-Making Process; Decision Routines; Decision Effectiveness)

Introduction

Organizations often go to great lengths to encourage decision-making by the rules. Yet, in spite of the normative and theoretical emphasis on the use of formal decision-making procedures in organizations, surprisingly, little is actually known about how they are fostered and their associated outcomes. This study investigates the extent to which decision makers use a prescribed decision practice for consequential decisions and the factors that influence its use. We also examine the outcomes associated with a formally prescribed decision-making practice—an area that has received very little attention in decision-making literature (Dean and Sharfman 1996). Our study is grounded in two assumptions: first, that an understanding of decision practice is fundamental to understanding resulting decisions and decision outcomes, and second, that researchers studying decision-making processes need to pay more systematic attention to the social contextual forces at work within organizational systems (Mowday and Sutton 1993).

We investigate three interrelated questions: First, to what extent can an organization enact a decision practice and make it stick? Second, what factors encourage or impede the use of what is prescribed? Finally, how are prescribed practices and the resulting decisions linked? In short, the goal of this study is to shed light on the ability of an organization to systematize decision-making practice and on the challenges of doing so. These questions are fundamental to organization and management theory because the design of decision systems is important for organizational effectiveness and is an important element of management-centered conceptions of organizations (Dean and Sharfman 1996, p. 368; Huber and McDaniel 1986).

To address these questions, we assess the effectiveness of one financial institution's planned efforts to influence decision rationality by formalizing the elements of information that decision makers are supposed to use for making important lending decisions. Although individual behavior is often the target of planned change efforts, few studies of change explicitly investigate changes in individual work behaviors, focusing instead on summary

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measures of job performance or changes in organizational outcomes (Robertson et al. 1993). Thus, this study has potential to fill a gap in the episodic and planned change literature (Weick and Quinn 1999). We also examine how decision-maker adherence to or deviation from a prescribed practice is influenced by a hierarchy of factors that reflect the socially embedded nature of organizational decisions (Granovetter 1992). Finally, we hope to shed light on the outcomes associated with the use of prescribed decision practices to better understand the challenges associated with the design of decision processes.

Theory and Hypotheses

Background

Because decisions can be complex, organizations often enact decision-making procedures to compensate for the bounded cognitive abilities of decision makers (March and Simon 1958). It is well established that decision makers use a number of decisional heuristics or cognitive shortcuts (Kahneman et al. 1982), which can bias decision outcomes in systematic ways. Moreover, studies show that these heuristics and shortcuts can systematically influence individual decision processes (Northcraft and Neale 1987) as well as frame individual judgments, and that they are elicited by both task and contextual influences inherent in many decision settings (e.g., McNamara and Bromiley 1997). Thus, organizations enact decision rules to replace the idiosyncratic heuristics decision makers may use to make their judgments and to increase the reliability of decision making and the predictability of decision outcomes for organizations and their members.

Standard decision practices can enhance technical efficiency because they channel decision makers' attention and behavior, thereby allowing them to conserve scarce resources such as time and attention. Yet, organizational practices also provide an important stabilizing function (e.g., March and Simon 1958) and are a "central ingredient in accounting for the reliability of organizations" (Scott 1995, p. 54). Organizational practices reflect the routine use of organizational knowledge (Szulanski 1996) and can render a distinct source of advantage that contributes to an organization's effectiveness. Decision practices increase decision-making effectiveness by decreasing the uncertainty surrounding decision outcomes. Because they embody knowledge of cause-effect relationships, operating practices guide decision makers' attention to the information necessary to form expectations about various alternatives (Dean and Sharfman 1996) and other elements critical to making a high-quality decision. It is on this aspect that we focus.

In this study we investigate organizational decision making practice by examining the extent to which decision-makers use specific pieces of information for making a risk-rating decision. We characterize our study as an investigation into the use of a supplied decision rule—a decision rule that is given to a decision maker to advise her or him on how to make a judgment. We use the term *decision rule* rather loosely, however, to reflect a prescribed practice (in this case, the use of particular pieces of information) rather than to reflect a more sophisticated algorithm for making a judgment. Because the decision rule in this case concerns the best pieces of information to use when making a particular type of judgment, the practice is targeted toward achieving an optimal decision, reflecting the organization's underlying values and beliefs that the practice will lead to more effective decision outcomes. We use the terms *decision practice, prescribed decision criteria, decision rule,* and *formal decision criteria* interchangeably to reflect the organizationally prescribed information that decision makers are supposed to collect and use in making a judgment. This prescribed set of criteria can be contrasted with ad hoc criteria that reflect information that does not fit into the formally prescribed categories.

There are two important reasons to examine how decision makers go about making decisions. The first is that decision practices matter. Studies of decision making in both laboratory (e.g., Arkes et al. 1986, Davis and Kottemann 1995, Powell 1991) and organizational settings (e.g., Dean and Sharfman 1993, 1996; Eisenhardt and Bourgeois 1988; Fredrickson 1984; Fredrickson and Iaquinto 1989) show that the way decision makers go about making decisions matters both to decision choices and to outcomes. What emerges from these and other decision-making studies is that important decisions (i.e., choices) are not simply the product of isolated information processing. Rather, different decision procedures lead to different choices. Moreover, different procedures lead to different outcomes.

A second important reason to pursue research in this domain is to better understand how decision practices (such as the prescribed use of information) are established, and the outcomes associated with their use. Some evidence suggests that decision practices are without order, that information and decisions are decoupled, and that decision makers process information without regard to its relevance to specific decisions (Cohen et al. 1972, Feldman and March 1981, March and Olsen 1986, March 1987). Other research suggests that decision processes characterized by the systematic collection of information relevant to the decision, and the reliance upon analysis of this information in making the decision, lead to more effective decision making (Dean and Sharfman 1993,

Langley 1989). An important unanswered question in the literature concerns what factors affect the extent to which decision makers collect and attend to relevant information when making a decision. Our study is focused on answering that question by examining information handling practices, their effect on decisions and decision outcomes, and how a hierarchy of multilevel influences shapes information handling in practice.

The Embeddedness of Decision-Making Practice

Our model is derived theoretically, based on the simple idea that decision-maker behavior (practice and ultimate choice) in naturalistic settings does not occur in a social vacuum. Rather, it is contextually embedded (Granovetter 1985, 1992). The idea is that action is situated and can't be explained solely by reference to an individual's choices. Consequently, we propose that decision-maker behavior is shaped both by the formal system of rules and organizational hierarchies, and by the multilevel relational contexts within which action occurs (Langley 1989, O'Reilly and Chatman 1996). Formalization facilitates the diffusion of practices throughout an organization. Still, just because decision-making practices are formalized within an organization does not mean that decision makers will use them. For many reasons, decision makers' operative norms and behaviors may depart substantially from formal requirements, and decision makers may perform a function in ways that are at odds with what is prescribed. We argue that adherence to or departure from formal requirements is shaped by the immediate contexts of action as well as the wider organizational context in which decisions are made.

Applying this line of thinking to our study suggests that multiple levels of influence structure decision-making practice within organizations. We consider three sets of factors, each operating at three different levels: the task/decision level, subunit level, and organization level. The most immediate level is that of the decision context. Decisions with particular characteristics are more likely to be addressed with particular methods (Thompson 1967). Consequently, we examine two decision-level factors: size of the decision and duration of the relationship with a decision target. At a higher level, decision practice is influenced by the subunit context in which decision makers are located, reflected in characteristics such as subunit size, subunit specialization, and past performance. The organizational context, in turn, influences decision practice through standardization pressures. Factors at each of these levels play some part in influencing decision-maker behavior, decision choices, and resulting outcomes. We present reasons for selecting these factors in the following section.

In summary, our study bridges levels of analysis by examining each decision and looking both at the cognitive processes evidenced by the extent to which prescribed information is cited in support of each decision and at how factors at each level influence decision-maker practice. We link cognition and context by suggesting that decision outcomes are the result of the way decision makers go about making decisions. These practices are influenced by a cascading hierarchy of influences related to the decision and the contexts in which decision makers are situated.

Antecedents of Decision Practice

Decision-Level Factors. Theory suggests that decision makers are more or less likely to use prescribed procedures when certain decision characteristics are present (e.g., Thompson and Tuden 1959), yet little attention has been paid to empirically examining how decision characteristics and *prescribed* decision processes are linked. Experimental studies in this domain have largely been confined to examining how a decision maker's use of prescribed rules is influenced by factors related to the decision task, such as performance feedback (e.g., Davis and Kottemann 1995, Powell 1991) or advice about how useful the rules will be for particular decisions (e.g., Davis and Kottemann 1995). Decision rules are enacted to prevent decision makers from incorrectly exercising discretion. Presumably this is essential, especially when decisions have important consequences. In other words, we would expect that decisions with important consequences will prompt decision makers to be more (or less) inclined to adhere to prescribed practices. Such consequences could occur, for example, when the size of the decision is large (e.g., involves significant resources) or when the decision concerns an exchange partner (decision target) about which little is known. We consider each of these conditions below.

Theory suggests that decision makers will use rational procedures when decisions have high stakes, although findings from the few studies that have investigated this premise empirically are mixed. For example, Carter (1971) found that decisions that could seriously affect a company's future involved more rigorous analysis than less important decisions. Similarly, results by Hickson et al. (1986) suggest that decision makers are more likely to use intendedly rational processes as the size (i.e., resources involved) of the decision increases. Dean and Sharman (1993) found no support for this relationship in a study of strategic decision making, but attributed the

result to constrained variance in their measure of decision importance. Although findings are mixed, it is plausible to think that as the size of the decision increases, decision makers will be more likely to use prescribed practices—presumably because adhering to the prescribed process will result in more effective decision making.

In addition to instrumental reasons, there are symbolic reasons for decision makers to use prescribed practices for high-stakes decisions. Collecting and using the prescribed information symbolizes capable management (Dean and Sharfman 1993, Langley 1989, Feldman and March 1981). When decisions have important consequences (such as when they involve substantial resources), they are more likely to come to the attention of superiors or other top managers who have the interests of the firm at heart. Consequently, decision makers may feel a need to demonstrate capable management to their superiors, especially when decisions are important. This suggests that as the stakes of a decision increase, decision makers will be more likely to rely on prescribed practices because superiors are more likely to perceive formally required information to be a legitimate basis for making a decision than information that lies outside formal requirements. These arguments lead to the following hypothesis:

HYPOTHESIS 1. *As the size of the decision increases, decision makers will use a greater proportion of prescribed decision criteria.*

An increasingly prominent feature of transaction-related decisions, such as those found in the commercial lending context, concerns the duration and continuity of the relationship between the exchange partners. Research suggests that experience with an exchange partner influences action (Granovetter 1985). Knowledge, experience, and strong expectations of trust and abstention from opportunism (Granovetter 1985, p. 490) accumulate as a relationship endures (Levinthal and Fichman 1988, Seabright et al. 1992). Consequently, over time, exchange relationships evolve from information exchanges to institutionalized relationships (Levinthal and Fichman 1988). Thus, the duration of an exchange relationship reflects both learning and commitment.

Taken together these findings have implications for decision-maker behavior. When a decision maker lacks knowledge about an exchange partner, he or she will need a wider range of information upon which to assess possible outcome consequences. In addition, studies show that when parties to a decision are not well known, decision makers are more vigilant in their search efforts and often consider issues much more carefully to preempt criticism (Tetlock 1992). Consequently, when a decision maker lacks knowledge about an exchange partner, he or she will be particularly systematic when making decisions crucial to their firm's future and will collect and use a wider range of information that falls outside of that which is organizationally prescribed. In contrast, in situations where a decision maker both knows the borrower and has developed a trust-based relationship with the borrower, he or she will require little new information (ad hoc criteria) and will have little need to deviate from the prescribed criteria to conduct a wider information search. The above arguments lead to the following hypothesis.

HYPOTHESIS 2. *As the duration of the relationship with the exchange partner increases, decision makers will use a greater proportion of prescribed decision criteria.*

Subunit Influences. What decision makers focus on and what they do depends on the particular microcontext in which they are located because attention and behavior is situated (Ocasio 1997, p. 190). This means that a decision maker's behavior is likely to be influenced by a subunit's existing routines that are tied to the underlying system of norms, values, and goals (O'Reilly and Chatman 1996). As these idiosyncratic behavioral routines are reinforced they become entrenched and institutionalized (Zucker 1987, p. 456). Thus, it is reasonable to think that autonomous units will develop particular decision practices as a consequence of factors unique to each unit's situational context, and these processes will be reflected in the type of information decision makers use in making decisions. Under some conditions, these differences can be an effective way to achieve differing organizational/subunit goals; under other conditions, however, these differences can impede the success of organization-wide initiatives to direct job-relevant behavior.

A number of cultural, material, and social factors could account for these idiosyncratic differences in decision-making practice (Ocasio 1997, p. 190; O'Reilly and Chatman 1996) including subunit size, subunit specialization, and past performance. For example, a subunit's size may reflect the extent to which it emphasizes norms to comply with formal requirements. Organizational theory and research supports the idea that larger units are more likely to require decision makers to adhere to formal decision policies than smaller units (see Scott 1987). Thus, we would expect that decision makers in larger units will rely more heavily on prescribed criteria and less on ad hoc criteria than decision makers in smaller units that are less concerned with formal rules and procedures.

Second, different subunits may have to tailor their practices to perform effectively. It is often the case that subunits develop specific expertise that relates directly to the context in which they are situated. And research supports

the idea that decision makers typically develop context-specific heuristics that guide their decision analyses (Day and Lord 1992, Regehr and Norman 1996). Thus, it is possible that decision makers tailor their decision practices to accommodate to the specific decision making requirements of the context. One important aspect of a subunit's context is the type of customers the unit serves. In the commercial lending context, subunits often specialize and target their services toward particular categories of customers. It is possible that certain classes of customers may be more readily evaluated using the generally prescribed criteria, while others may require other ad hoc criteria to be effectively evaluated. The idea is that the routines that develop around borrower evaluations are driven, in part, by the characteristics of the customer base that the branch serves. Support for this line of thinking comes from research on service firms (Nayyar 1990, Brush and Artz 1999) suggesting that the critical resource bases of service firms are intangible. Consequently, in contrast to more traditional manufacturing industries, service firms may not be as effectively evaluated using a set of financial ratios (of which the prescribed criteria are composed). Thus, branches that focus on service firms may rely on ad hoc criteria more than branches that focus on manufacturing firms.

Finally, a subunit's past performance could also materially influence decision-maker behavior. Theories of success suggest that decision makers in highly performing units are more likely to be deemed competent and may be subject to less scrutiny than decision makers in poorly performing units (e.g., Miller 1993, Sitkin 1992). In contrast, decision makers in poorly performing units may feel added pressure to conform to the rules for instrumental reasons (because the practices are presumed to lead to more effective decisions, as noted in Hypothesis 1) or for symbolic reasons, to demonstrate legitimate and capable behavior to superiors or others with whom the decision maker may consult or who may monitor the decision maker's behavior. This leads to the following hypothesis:

HYPOTHESIS 3. *Subunit characteristics (size, customer base, past performance) will be related to the degree to which the unit's decision makers use prescribed decision criteria.*

Organization-Level Context. Decision-maker behavior is regulated also by the wider organizational context, which is substantively shaped by the larger organization's rules and procedural specifications. Organization-wide rules, in particular, signal the value and legitimacy of appropriate behaviors and thereby provide, through formal means, the principles of action, interaction, and interpretation that guide and constrain decision makers in accomplishing their tasks (March and Simon 1958, Thompson 1967). All else being equal, as job definitions and concrete procedural specifications become more standardized and formalized, decision makers will be more likely to use a prescribed practice not only because they expect these practices to be of instrumental value, but also because the criteria are salient, and because adhering to the practice is considered to be a "legitimate" way to make a decision.

There are also reasons to expect that efforts to formalize decision-making practice will be modest and/or transient. First, although formal control systems are grounded in the idea that people will unfailingly accept legitimate authority, psychological theories of reactance highlight that people have strong desires to maintain their personal control and freedom of action (Worchel and Brehm 1971). Second, new behaviors can also be difficult to establish because insufficient time is spent on "unfreezing" and cognitive restructuring (Schein 1996). Moreover, although it is possible that decision makers will increase their use of standard decision practices soon after a change is enacted, they may subsequently revert to earlier learned behaviors (Weick 1996) or be less motivated to rely on the new procedures once standardization pressures taper off (Tyre and Orlikowski 1994). While these arguments call into question the amplitude and sustainability of formalization efforts, they do not negate the general premise that these efforts will have some effect. Consequently, we hypothesize the following:

HYPOTHESIS 4. *As organizational pressures to standardize decision making become stronger, decision makers will use a greater proportion of prescribed decision criteria.*

Outcomes of a Prescribed Decision Practice

Organizations typically seek to standardize decision making for several reasons, including a desire to increase the consistency of the decision-making process both within and across organizational units, as well as to raise the consistency of the decision evaluations over time. Decision rules are likely to increase the stability of decision assessments over time as they alter both the range of information considered as well as the cognitive processes used to evaluate the information. Fundamentally, decision rules are designed to codify organizational learning and constrain the attention of the decision makers so that they ignore extraneous information that simply adds noise to their decision evaluation processes (Levitt and March 1988). Alternatively, decision rules may cause a decision maker to ignore, overlook, or otherwise become aware of

critical factors that indicate important changes in the decision environment. In either case, decision rule use should engender stability in assessments.

Research suggests that the amount and types of information used in assessing decision targets are related to the level of certainty the decision maker experiences with the decision (Leblebici and Salancik 1981). For example, in a study of loan decision making, Leblebici and Salancik (1981) found that decision makers who perceived a high degree of certainty about a decision target (loan applicant) were less likely to gather and consider ad hoc information—information not part of that normally/formally required. In other words, lenders are more likely to perceive a high degree of certainty about a decision target, such as a borrower, when they perceive the quality of the borrower to be steady. Taken together, these findings suggest that the use of prescribed rules may signal a decision maker's level of certainty about a borrower and the likelihood that they will stick with their previous assessment of the borrower's situation.

In addition to influencing the type of information decision makers take into account, standardized decision processes will also influence the way in which decision makers process information when evaluating decision targets. Researchers discussing the role of automatic versus active cognitive processing and its link with decision procedures (e.g., Dutton 1993, Gioia and Poole 1984) suggest that decision makers using standardized rules will engage less in active processing and more in "scripted" automatic processing. Decision makers in automatic mode are less likely to see the need for a change in their decision assessment than decision makers in active mode. Thus, over time, we would expect to see evidence of stable patterns in their assessments. For this reason and the reasons included in the previous paragraph we hypothesize:

HYPOTHESIS 5. *The greater the proportion of prescribed criteria decision makers use in time (t), the less likely they will be to change their decision assessment from time (t − 1) to time (t).*

Method

Research Context

To study an organization's ability to systematize day-to-day decision practices we examined a context in which decision makers making important decisions were faced with a planned change in decision-making procedures. We studied the decisions made by loan officers located in five branches of a large commercial bank in the Midwest that underwent a structural reorganization and redesign in management procedures. All branches included in the study had been loosely affiliated with the parent bank for more than 10 years before the changes were initiated.

Prior to the year of the reorganization, the bank was organized as a holding company, with each branch a separate entity. Then, in response to a regulatory change, the bank changed both its legal structure (from separate affiliated banks to an integrated bank with multiple branches) and management practices. One set of changes was focused on standardizing risk assessment and lending policies and the associated decision-making practice across branches. It is important to note that although many organizational changes were enacted, to our knowledge, no significant changes were made to the formal reward system during the period of the study.

Although organizations often introduce formal procedures to increase decision-making efficiency, interviews with senior managers revealed that increased efficiency per se was not the goal of this effort. Risk-rating decision practices were already routinized throughout the organization, but decision practices were idiosyncratic to each organizational subunit. Top management wanted to increase both the predictability of decisions and decision effectiveness by codifying organizational learning. Specifically, interviews with senior managers revealed that the institution was interested in (a) developing a "best practice," (b) developing a consistent process across banks (i.e., subunits), and (c) ensuring that the process was uniformly understood and implemented. As managers pointed out, the standardization effort lengthened the review process and resulted in longer loan review documents and more systematic reviews by superiors.

The year before the new decision practices were implemented, the bank convened an internal panel of top managers and senior lenders and used a delphi process to create the set of "standard criteria" that loan officers would be asked to use. To generate the set of criteria, panel members drew from their relevant collective expertise, an assessment of current industry practices, and information gleaned from pertinent professional publications. The final set of criteria comprised eight categories of factors deemed by bank managers to be the *most important* criteria for assessing the risk of commercial borrowers. The criteria included conventional factors commonly used in the banking industry to evaluate the health of an organization, including cash flow, financeable assets, net income, liquidity, leverage, collateral, firm size, and sources of loan repayment.

The bank enacted the refined decision-making practices in the following year and trained all lending officers in using the prescribed set of risk-rating decision criteria to assess the risk of commercial borrowers. The formal

criteria were printed on a table titled the "Risk-Rating Implementation Guide," which was included in a newly developed commercial lending procedure manual.

In this study, we define the criteria included on the risk-rating guide as "prescribed decision criteria" because in its training materials, the bank identified these criteria as being the primary factors that loan officers *should use* to assess borrower risk. The bank did not go so far as to identify these criteria either as a minimum or maximum set of decision criteria to be used in making a decision. Rather, top managers identified these factors as the *most important* evaluative criteria. In reviewing borrower files, however, we found that decision makers did not simply rely on the recommended criteria. Bankers often cited other criteria as the basis for their borrower assessments. In contrast to the formally prescribed decision criteria, we define these criteria as ad hoc because they were not included in reference materials, were not discussed during the formal training of commercial lenders, and were not included on the risk-rating guide in the lending procedure manual.

It is important to note that the prescribed decision criteria are primarily focused on information related to the financial strength of the company (i.e., cash flow, net income, liquidity, leverage, financeable assets), whereas the ad hoc criteria are focused on information related to management capabilities (e.g., management succession, quality of management, experience with the business), market position of the firm (e.g., firm efficiency, age of corporation, market position, reputation, rate of growth), and the characteristics of the firm's environment (e.g., industry, product demand, cyclicality of industry).

Although this was a convenient sample to investigate how decision practices are fostered in organizations and how are they linked to decision outcomes, we chose to study decision practices in this setting for two other reasons. First, this context (i.e., commercial lending decision making) enabled us to collect data on a large number of similar decisions made over an extended period of time. Although many corporate decisions involve substantive evaluation of risk, in many instances, especially when decisions are infrequent and unique, the evaluations are not recorded and information used to make the decision is not systematically retained. The commercial lending context overcomes these problems and allowed us to examine decision characteristics, the information used to make the decision, and the decision outcome across a range of very similar judgmental decisions within a single organizational setting.

Second, although we cannot directly assess the generalizability of the findings, commercial lending decisions parallel a range of risky business decisions in several ways. Commercial lending decisions involve allocation of firm resources for expected gain where there is a degree of uncertainty about the decisions' returns and risks, and where the success of the decision is only partly under the control of the decision maker. Additionally, as with many organizational decision processes, one employee leads on the decision, but supervisors regularly review and approve the decision made by the lending officer. On particularly difficult or important decisions, a group may work on the decision. Not surprisingly, the degree of managerial oversight directly relates to the monetary value of the decision. This structured decision process with significant human judgment is very similar to the types of processes found in case studies of organizational decision processes (e.g., Bromiley 1987). And these characteristics (individual lead, managerial oversight, and group decisions on major financial outlays) can be found in many corporate decisions including product development, market expansion, capital investment, and hiring. In short, while our study of a single type of decision may not generalize to all business decisions, commercial lending constitutes an important kind of business decision and incorporates process, context, and content that are similar to a range of business decisions.

Sample and Data

We collected the interview and archival data to test our hypotheses from the community banking division of each of the five branches specializing in lending to commercial borrowers. Although there were more than 30 bank branches in the metropolitan area, most branches served private customers, and the commercial loan operations were concentrated in five branches.

Because the bank typically maintains ongoing relationships with commercial customers, the responsible lending officer is required to conduct an annual review of each borrower. The purpose of the annual borrower review is to reevaluate the current creditworthiness of a borrower using a seven-point rating scale, with a one being the lowest risk and a seven being the highest risk.

The risk-rating decision is the most critical decision in the borrower review process because it largely determines whether a new loan is approved, whether an existing revolving loan is continued, the interest rates charged on the loan, the loan-loss reserves that the bank will hold to account for the possibility of default, the level of ongoing monitoring of the borrower and the loan, and the unit within the bank that will be responsible for the management of the borrower relationship. Thus, it is the central decision in a lending relationship with a borrower. Although the specifics of the borrower evaluation process vary from loan to loan, to assess the risk of the borrower,

the lending officer typically reviews the borrower's financial statements, meets with the management of the firm, and tours the business's facilities.

Once the lending officer completes the evaluation of the borrower, he or she prepares a Credit Approval Presentation (CAP). The CAP is the written document that supports the borrower evaluation and approval. As part of the CAP, the lending officer reports the criteria that he or she utilized in assessing the risk level of the borrower. A sample of each branch's loan files are audited by an internal auditing group on an annual basis, and the auditors routinely question whether the lending officer properly assessed the risk of the borrowers. Thus, the CAP is considered to be a very important document.

We collected annual borrower review data for 223 firms for a period of six years from the loan files at the five bank branches studied. These 223 firms represent all of the small business borrowers (less than $20 million in sales) at these five branches with loan sizes of at least $100,000, the minimum loan size requiring full loan documentation. We collected data that included the date that the lending relationship was established, the amount of the loan, the risk rating, and the pieces of information (i.e., decision criteria) lenders cited as the basis for their risk-rating evaluation. The unit of analysis in this study is the risk-rating decision. Because of multiple years of data for each firm, the data set included 900 complete observations. Because some borrowers entered the bank during the period of the study and others left, we do not have a full six years of data for all borrowers.

Measures

Dependent Variables. We created three dependent measures for the first analyses examining the *antecedents* of decision practice. The percentage of the total number of risk-rating decision criteria cited for each decision that reflected one of the organizationally prescribed categories constitutes the primary dependent variable. We noted earlier that the prescribed criteria reflect the most important factors that loan officers *should use* to assess borrower risk, but they neither constituted a minimum nor a maximum set of decision criteria to be used in making a decision. Thus, decision makers could include ad hoc criteria to support their decisions. Our primary dependent measure provides an assessment of the extent to which lenders used more or less of these prescribed criteria relative to the total number criteria they used. We also created a measure of the absolute number of prescribed criteria cited for each decision and a measure of the absolute number of ad hoc criteria cited for each decision.

To create the dependent measures, three coders, two researchers and one senior bank executive independently coded each of the pieces of information cited by loan officers for each risk-rating decision into one of two categories: prescribed or ad hoc. A piece of information was categorized as "prescribed" if it fell into one of the eight categories published on the risk-rating guide or as "ad hoc" if the criterion did not fit into one of the standard categories. The interrater reliability using Cohen's Kappa (Cohen 1960) was $k = 0.7126$, $p < 0.0001$. The magnitude of the test statistic ($z = 13.29$) suggests that there was a substantial level of agreement between coders (Landis and Koch 1977). In the few instances where coders disagreed, the disagreements were resolved through discussion.

To derive our primary dependent variable, we first counted the number of prescribed criteria cited for each decision and then counted the number of ad hoc criteria cited for each decision. We then calculated the main dependent variable by dividing the number of prescribed criteria by the total number of criteria cited for a decision and multiplying by 100. The other two measures were simple counts. The percentage and absolute measures of decision rule use distinguish between "degree" and "amount." We transformed the dependent variables to address issues of nonnormality in their distribution. We transformed the percentage of prescribed criteria by subtracting the percentage value from a constant and then taking the log of that value. We transformed the number of prescribed criteria variable by subtracting it from a constant and then taking the square root of this score. Finally, we transformed the number of ad hoc criteria by adding one to its value and then taking the log of that value. In presenting our results, we reverse score the values for the percentage and number of prescribed criteria to preserve the low to high ordering.

The *outcome* associated with the use of the prescribed criteria in which we were primarily interested was the stability in the risk-rating assessment. To assess whether or not there was evidence of stability, we measured the risk assessment of the borrower in both the prior (t-1) and the current year (t). We then created an indicator variable to measure whether the risk assessment of the borrower had remained the same or changed, indicating stability or instability in the decision assessment.

Independent Variables. We measured current size of the loan in millions of dollars. We assessed the duration of the relationship between the bank and the borrower in terms of the number of years. Data for both of these variables were obtained from the loan review documents.

We assessed three branch variables—branch size, unit expertise in terms of customer base, and prior performance—to assess the extent to which subunit characteristics are associated with use of decision criteria. The size

of the bank branch was measured using the average size of the commercial loan portfolio within the branch in millions of dollars. We assessed the customer base of the bank by calculating the percentage of the branch's commercial customers that were from manufacturing as opposed to service industries. Each branch's prior performance was measured as the net income for lending divided by the total size of the branch's lending portfolio. These three measures were calculated on an annual basis.

We assessed the strength of the institution's efforts to standardize decision practice across the organization's geographically separated subunits using a perceptual measure because we were unable to objectively measure standardization. As noted, the bank undertook a major standardization effort during the time of the study. We asked three senior managers who had been in top-level management roles throughout the study to complete a short questionnaire to assess the degree of standardization by year across the entire bank. Our measure of standardization consisted of four questions rated on a seven-point Likert-type scale. Three items were adapted from Van de Ven and Ferry's (1980, p. 161–162) measure of unit standardization. A sample item included "How many rules and procedures were there for conducting loan reviews in the following years?" The fourth question asked top managers to assess the degree of standardization across subunits (branches). The Cronbach's alpha across the four items was greater than 0.98 for each informant. We also calculated the intraclass correlation to test for inter-rater reliability and found that there was significant agreement among the coders ($r_1 = 0.51$) (James, 1982). We averaged the responses across questions and informants to get an overall indication of the strength of standardization by year. As we expected, the data indicated that the strength of standardization increased over the time period of the study.

Analyses

We tested Hypotheses 1–4 using repeated measures regression. As with much organizational research, this study includes variables from multiple levels of analysis (i.e., decision-level, branch-level, and organizational-level variables), necessitating that we use an analytic technique that appropriately models nested data. We identified two techniques that have been used to address the issue of multilevel analyses in organizational research: hierarchical linear modeling (HLM) (Bryk and Raudenbush 1992) and repeated measures regression (RMR) (Cohen and Cohen 1983). HLM has received increased attention in the organizational field in the last several years as being a flexible statistical method for examining nested data because it allows a researcher to "simultaneously investigate relationships within a particular hierarchical level, as well as relationships between or across hierarchical levels" (Hofmann 1997, p. 726). HLM models both Level 1 random effects and Level 2 and higher fixed effects simultaneously using a multilevel regression-based approach (Hofmann 1997, p. 729–730). There is one significant limitation in the HLM method that prevents us from using it in this study. HLM requires the data to be fully nested in one hierarchical direction. Our data are cross-nested. Our data are nested both within borrowers across years as well as within branches by year and finally by level of standardization (which is measured on an annual basis). While we are not hypothesizing effects within borrowers across years, we need to control for this since, with the panel nature of the data, there is likely to be significant autocorrelation across the years for a given borrower. Although the most recent version of the HLM software (HLM 5) allows for the estimations of autocorrelation in the data, this is only true if the autocorrelation occurs in the same nesting direction as the Level 1 variables included in the analysis (i.e., autocorrelation can only be estimated at Level 1). In other words, with the structure of our data and hypotheses, HLM would allow for autocorrelation across decisions within a branch for a given year, but not within borrowers across years.

Repeated measures regression addresses the multilevel issue using general linear model principles (Cohen and Cohen 1983). With repeated measures regression, the researcher first partitions the variance in the dependent variable to reflect the variation in the criterion that occurs at each of the levels that is being modeled. The researcher then uses results from a hierarchical regression analysis, starting with variables at the lowest level of analysis, to test for the degree to which the variables explain the variation in the dependent variable that occurs at the same hierarchical level as the current independent variable. RMR also requires that the researcher employ the appropriate degrees of freedom to calculate significance at each level of analysis (Cohen and Cohen 1983, Hollenbeck et al. 1993). As we describe below, RMR addresses the violations that occur when researchers analyze multilevel data using OLS regression.

First, the method allows researchers to examine the ability of a given independent variable to explain the variation in the dependent variable that occurs at the same level as the independent variable while holding the variance at the other level constant. That is, when analyzing relationships at the individual level, the effect for organization is controlled (creating independence among the lower level scores that are now residuals), and when examining effects at the organizational level, lower level

responses are aggregated to arrive at a single, independent score for each organization.

Second, the *F*-test for each variable is calculated using the appropriate degrees of freedom. For example, in a study with 400 observations that are nested within 40 organizational units, a variable that varies at the decision level would be examined using 400 less the number of degrees of freedom for the variables in the model, or 359 degrees of freedom if the study included one independent variable at each level. However, variables that reside at the organizational level would be tested using the organizational unit number of degrees of freedom, or 38 degrees of freedom if the study included one independent variable at each level. Because the individual responses are effectively summed to create a single score for each organization, these are independent observations. This method has been widely employed in the medical literature (e.g., Carter et al. 1986, Jacobs et al. 1999, Balanda et al. 1999) and has been increasingly used to examine multilevel models in the organizational literature (e.g., Hollenbeck et al. 1995, Hollenbeck et al. 1998, Ryan et al. 1999, Walker and Smither 1999, Hedlund et al. 1998, Phillips 2000). Given that the repeated measures regression method allows us to appropriately test a multilevel model while also allowing us to control for serial correlation in the data, we chose to use this analytic method to study the hypothesized relationships.[1]

We entered the independent variables into the analyses in three phases because they reflect three distinct levels of aggregation. We first entered size of the loan and relationship tenure because they are measured at the lowest level of aggregation: the individual borrower decision. In the second series of steps, we added variables that are measured at the branch level: subunit size, customer base, and prior unit performance. In the final step, we added the organization-level independent variable: degree of standardization. This entry process allowed us to focus on the ability of the variables to explain the variance in decision practice that occurred at their respective level of analysis as well as to use the appropriate degrees of freedom in assessing the significance of the contribution of each variable. We used the generalized least squares regression module in SAS to generate the information needed at each step to calculate the repeated measures regression statistics, and the Yule-Walker procedure to correct for first-order autocorrelation. We also corrected for higher order heteroscedasticity using the GARCH procedure in SAS. The resulting statistics indicated that these procedures effectively corrected for autocorrelation and heteroscedasticity.

We tested Hypothesis 5 using logistic regression because the dependent variable associated with Hypothesis 5 is dichotomous. The independent variable in which we were interested was the percentage of prescribed criteria cited. To control for extraneous macroeconomic effects that could influence the overall quality of the loan portfolio, we included a control variable to account for the macroeconomic conditions of the region in which all of the bank branches were located. Using data from the Statistical Abstracts of the United States, we measured the economic health of the bank's metropolitan region as the percent change in per capita net income over the time period during which we examined decision effectiveness.

Preliminary Analysis. Our theorizing, in part, is based on the assumption that the criteria that decision makers reported reflect the criteria they actually used in making a decision. We cannot directly assess the degree to which information reported in the CAP matches the actual criteria used because there is no way to systematically capture proxy variables to measure the ad hoc criteria. Still, we attempted to assess this assumption indirectly by examining the extent to which proxies for the prescribed criteria predict the risk rating assigned to a borrower. In our data set we were able to identify financial variable proxies for six of the eight prescribed criteria: cash flow, profitability, liquidity, leverage, collateral margin, and size. We split a sample of 540 observations, all observations for which we had the necessary financial data, into two equal sets: those observations for which the loan officer had cited an above average number of prescribed criteria and those for which the loan officer had cited a below average number of prescribed criteria. We used logistic regression to examine the extent to which the six variables predicted the risk rating assigned to the borrower. The results provide support for the assumption that the criteria reported by decision makers reflect the decision criteria they substantively used in their evaluations. First, we found that the proxies for the prescribed criteria have greater explanatory power in predicting the risk rating of the observations where loan officers cited a greater (above average) number of prescribed criteria than for observations where loan officers cited fewer (below average) ($X^2 = 216.20$ vs. $X^2 = 107.53$, respectively). Second, a greater number of the individual variables were significant for the above average observations than for the below average observations. For the above average sample, the proxies for profitability, liquidity, leverage, size, and collateral margin were all significant at either the 0.01 or 0.05 levels. In contrast, for the below average sample only profitability and leverage were significant at either the 0.01 or 0.05 levels. These results suggested that the decision criteria reported in the CAP reflect the actual

information decision makers used in making their judgments and allowed us to move ahead to test the hypotheses.

Results

Table 1 presents a year-by-year distribution of the decision criteria cited by decision makers. Decision makers used a combination of prescribed and ad hoc criteria in making their risk-rating decisions, although they used a higher percentage of prescribed criteria (85.7%). This is not surprising because these criteria are formally required, legitimately accepted, and presumed to be fundamental for assessing the financial health of a corporation. Still, on average, decision makers cite only about half of the total number of prescribed criteria categories in their decision analyses.

Table 2 reports descriptive statistics and correlations between each of the variables included in the analyses. The results show a negative correlation between the number of prescribed and the number of ad hoc criteria. The results of the repeated measures regression analyses for our primary dependent variables are shown in Table 3.

Hypothesis 1 states that as the size of the decision increases, decision makers will use a greater proportion of prescribed criteria. As shown in Table 3, the percentage of prescribed criteria cited is positively related to loan size ($p < 0.01$), supporting Hypothesis 1. Also in support of Hypothesis 1, we found a positive association between the number of prescribed criteria cited and loan size ($p < 0.01$) and a negative relationship between ad hoc criteria and loan size ($p < 0.01$).

Hypothesis 2 states that as the duration of the relationship with the borrower increases, decision makers will use a greater proportion of prescribed criteria. As shown in Table 3, the longer the relationship, the greater the percentage of criteria cited that are prescribed ($p < 0.01$). Moreover, relationship duration is significantly negatively associated with the number of ad hoc criteria cited and significantly positively associated with the number of prescribed criteria cited. These results provide support for Hypothesis 2.[2]

Table 1 Distribution of Decision Criteria Cited by Year

	1986	1987	1988	1989	1990	1991
% of Criteria Cited That Are Prescribed	78.0%	82.7%	91.1%	88.0%	87.6%	84.0%
Prescribed Criteria	2.38	3.10	4.20	4.12	3.97	3.82
Ad Hoc Criteria	0.67	0.65	0.41	0.56	0.56	0.73
Total Criteria Cited	3.05	3.75	4.61	4.68	4.53	4.55

We included three branch characteristics to examine the possibility that subunit factors drive the differences in decision practice (Hypothesis 3). Only subunit size demonstrated a consistent significant effect. Consistent with our reasoning, lenders in larger branches demonstrated greater reliance on prescribed criteria in their decision analyses ($p = 0.05$). Interestingly, the effect of bureaucracy seems to cause decision makers to use fewer ad hoc criteria ($p < 0.05$) as opposed to a greater number of prescribed criteria. The customer base of the branch and prior unit performance appeared to have little, if any, effect on the decision criteria reported by commercial lenders. Thus, we find support for Hypothesis 3, but only for subunit size.

Hypothesis 4 predicts that the stronger the organization's efforts to standardize decision practice, the more decision makers will use prescribed criteria. The signs of the parameters are in the hypothesized direction for all three dependent variables, but they are not significant. Thus, the results do not support our hypothesis. However, this is not surprising because the test effectively includes only six observations, one for each year of data in the sample. Hence, our tests have little statistical power. To further examine the relationship between perceived standardization and decision rule use, we used ANOVA to examine the extent to which reliance on prescribed criteria varied over the years of the study. We found systematic differences across the years ($F = 3.92$, $p < 0.01$). We used a Bonferroni test to examine the differences and found that while the reliance on prescribed criteria was higher in 1988, the year that the decision process was standardized, than in either 1986 or 1987 ($t = 3.71$ and $t = 3.80$, $p < 0.01$), the reliance on these criteria was significantly less in 1991 than in 1988 ($t = 2.76$, $p < 0.05$). The patterns are similar for the other two dependent measures. This suggests that the standardization effort influenced decision makers' practices in the period immediately following the introduction of the new practice, but the effects appeared to wane over time. This result is consistent with the idea that the outcomes of organizational change efforts are somewhat transient (Schein 1996, Tyre and Orlikowski 1994, Weick 1996), even though bank managers perceived that standardization efforts were continuing. Although senior managers perceived a slight decline in pressures for standardization over the two years following the study period (from 5.88 to 5.63), the results suggest that their perceptions of the decline lagged behind the material change in decision-making practices taking place years before.

Hypothesis 5 predicted that the greater the proportion of prescribed decision criteria used, the less likely a change in the decision assessment from time (t-1) to time

Table 2 Means, Standard Deviations, and Intercorrelations[a]

Variables	Mean	S.D.	1	2	3	4	5	6	7	8
Percentage of Criteria That Are Prescribed	0.57	0.75								
Number of Prescribed Criteria Cited	1.99	0.39	0.47**							
Number of Ad Hoc Criteria Cited	0.15	0.20	−0.96**	−0.42**						
Size of Loan	1.12	1.28	0.10**	0.11**	−0.06†					
Duration of Relationship	14.47	14.89	0.10**	0.14**	−0.10**	0.03				
Subunit Size	85.18	21.30	0.16**	−0.12**	−0.20**	0.00	−0.06†			
Customer Base	0.47	0.06	−0.03	−0.14**	0.01	−0.10**	−0.10**	0.15**		
Prior Unit Performance	1.66	1.23	0.00	−0.12**	−0.02	0.04	−0.12**	−0.02	−0.19**	
Strength of Standardization	4.86	1.44	0.07*	0.25**	−0.04	0.10**	0.06†	0.15**	−0.15**	−0.20**

[a]$N = 900$, †$p < 0.10$, *$p < 0.05$, **$p < 0.01$

Table 3 Results of Repeated Measures Regression Analyses

	Percentage of Criteria Cited That Are Prescribed			Number of Prescribed Criteria Cited			Number of Ad Hoc Criteria Cited		
Independent Variables	Steps 1–2 Decision-Level	Steps 3–5 Branch-Level	Step 6 Org.-Level	Steps 1–2 Decision-Level	Steps 3–5 Branch-Level	Step 6 Org.-Level	Steps 1–2 Decision-Level	Steps 3–5 Branch-Level	Step 6 Org.-Level
Intercept	0.54	0.56	0.56	2.00	2.00	1.99	0.12	0.14	0.13
Decision-Level Variables									
Size of the Loan	0.09**	0.09	0.09	0.04**	0.03	0.03	−0.02**	−0.02	−0.02
Duration of Relationship	0.08**	0.09	0.08	0.05**	0.05	0.04	−0.02**	−0.03	−0.02
Branch-Level Variables									
Subunit Size		0.17*	0.16		0.01	−0.01		−0.05*	−0.05
Customer Base		−0.02	−0.02		−0.05	−0.03		0.00	0.01
Prior Unit Performance		−0.01	−0.00		−0.05	−0.03		−0.00	−0.00
Organization-Level Variable									
Strength of Standardization			0.02			0.09			−0.01
Total R^2	0.02	0.05	0.05	0.03	0.06	0.10	0.02	0.06	0.06
Incremental R^2		0.03	0.00		0.03	0.04		0.04	0.00
Proportion of Variance Explained									
At Decision-Level	0.03			0.09			0.03		
At Branch-Level		0.14			0.08			0.17	
At Organization-Level			0.05			0.25			0.00

$N = 900$, †$p <= 0.10$, *$p <= 0.05$, **$p <= 0.01$

R^2 values exclude the variance explained by the autocorrelation and heteroscedasticity corrections.

(t) (i.e., the more stable the assessment in the short term). Consistent with this hypothesis, the results show that the more decision makers used the prescribed criteria in time (t), the less likely they would be to change the borrower's risk rating from the prior assessment (time t-1 to t) (parameter estimate $= -0.26, X^2 = 10.24, p < 0.01$). Also consistent with our argument, the number of ad hoc criteria cited was positively associated while the number of prescribed criteria was negatively associated with the likelihood of change ($p < 0.01$ and $p < 0.05$, respectively). All three tests support the contention that the allocation of attention on the prescribed criteria would lead

to stability in borrower assessments. We argued that stability in ratings over time could benefit an organization. Our logic was based on the idea that by focusing a decision maker's attention to the most important and relevant information, rule-following can cause a decision maker to ignore extraneous information that adds noise to the borrower evaluation process and unnecessary volatility to the ratings. A possible downside to rule following, however, is that of "appropriate, rather than optimal, behavior" (March 1981). As March (1987) highlights, procedures may be followed because they have been learned as appropriate in a particular situation or as part of a particular role, rather than because they reflect a deeper commitment to rational choice as a basis for action. Thus, the stability in the assessment may also reflect cognitive inertia and may foreshadow negative consequences if this stability is a consequence of sticking with rules and overlooking other important information that lies outside the prescribed categories.

To assess these competing perspectives, we conducted a post hoc analysis to examine the relationship between reliance on prescribed criteria in time (t) and the likelihood that a borrower's risk rating would be downgraded in the following year ($t + 1$), reflecting increased risk associated with loans made to the borrower. Research on bank lending practices (McNamara and Bromiley 1999) suggests that downgrading of risk is a key indicator of decision *ineffectiveness* because the profitability of a commercial loan decreases as its risk increases. After controlling for macroeconomic conditions, we found a positive association between the percentage of prescribed criteria used in time (t) and the likelihood that a loan would be downgraded in the following year ($t + 1$) (parameter estimate $= 0.15$, $X^2 = 4.50$, $p < 0.05$) and two years in the future ($t + 2$) (parameter estimate $= 0.31$, $X^2 = 7.05$, $p < 0.01$). We also found evidence that the more ad hoc criteria cited in time (t), the less likely a loan would be downgraded in time periods $t + 1$ and $t + 2$ ($p < 0.10$ and $p < 0.05$, respectfully). We found no significant relationship between the absolute number of prescribed criteria cited and likelihood that the loan would be downgraded in time ($t + 1$), but we did find a positive relationship when assessing the likelihood of downgrading in time ($t + 2$) ($p < 0.01$). Together, these findings suggest that the extent to which decision makers overlooked, ignored, or otherwise failed to seek out and consider the idiosyncratic ad hoc criteria and instead focused on the prescribed criteria in their evaluations affected the likelihood that a loan risk rating would be downgraded in future time periods. One plausible explanation for these findings is that reliance on the prescribed decision rules engendered a myopic or automatic processing of decision targets that caused decision makers either to be lax in their search efforts, or to ignore important information, and this subsequently affected their judgments.

Discussion

The primary findings of our study are that decision-making practice is not solely a function of individual choice, and that decision practice influences decision outcomes. Decision practice was influenced by aspects related to the decision as well as aspects related to the context in which decision makers were situated. Decision makers were more likely to use prescribed decision criteria for important decisions (decisions that involved larger resource commitments and unknown targets). In addition, decision makers in larger subunits were more likely to adhere to prescribed practice. Reliance on prescribed criteria in the short term was associated with stability in decisions. Decision makers who used a greater proportion of prescribed criteria were less likely to change their risk assessments from the prior period. But reliance on prescribed criteria in the long term had some untoward consequences; decision makers who used a greater proportion of prescribed criteria were more likely to downgrade loan risk in the following periods.

From a theoretical standpoint, beyond confirming the idea that decision maker behavior is situated and is not simply a function of individual choice, this study calls into question the role intentional change efforts play in influencing individual decision maker behavior. Most studies of planned change focus on summary measures of job performance or changes in organizational outcomes and have provided little insight into changes in individual-level behavior. Our findings suggest that planned organizational change can influence decision makers to significantly alter their job-specific behavior, at least for a time. But as time progresses, adherence to new practices appears to erode. The findings, in part, contrast with the findings of some studies of planned change and technological adaptation, but are consistent with studies of adaptive structuration and process innovation.

Planned change most often occurs through the replacement of one set of behaviors for another (Ford and Backoff 1988). However some studies show that replacement seldom works (e.g., Beer et al. 1990, Tyre and Orlikowski 1994). In our study, replacement worked insofar as decision makers were quick to adopt the new decision practice after it was introduced, after decision makers received training and revised procedure manuals, when the new practice was highly salient. But use of prescribed criteria waned over time (while use of ad hoc criteria waxed) even though top management continued to exert

pressures for consistency and conformity. This suggests that organizational efforts to influence the more micro aspects of decision making are powerful and yet somewhat transitory. This may be because of the difficulties in establishing new behaviors, because new behaviors often decay over time, or because decision makers regress to earlier learned behaviors. Alternatively, consistent with theories of adaptive structuration (see Poole and DeSanctis 1990, and DeSanctis and Poole 1994), technological and process innovation (e.g., Barley 1988, p. 51, Tyre and Orlikowski 1997), and accommodation (Orlikowski 1996), which account for stability and change in organizational processes and practices, the change in the use of criteria over time could represent a process through which loan officers produced and reproduced their own version of the procedure for future use.

Central to the process of adaptive structuration is the interplay between what Poole and DeSanctis (1990) have distinguished as the spirit of the technological structure (i.e., specific tools and techniques for instrumental action) and the specific features decision makers use. The spirit reflects the general goal of the tool (in our case, the goal of prescribed practice was to promote rational decision making), while the feature is a specific rule or resource that operates in a group (in our case, the feature was the use—or not—of prescribed criteria). Even though users or others may plan and try to control the use of practices, decision makers may appropriate (use, adapt, or reproduce) practices in ways that are consistent with the original intent (faithful appropriation) or contradictory (ironic appropriation) (Poole and DeSanctis 1990). And in this way, practices are modified gradually through a series of small imperceptible changes, which are shaped by the context (Poole and DeSanctis 1990). With respect to our study, it is possible that the prescribed criteria failed to capture the range of information necessary to fully and effectively make a judgment. The slippage in the use of the prescribed criteria may reflect decision makers' actions to supplement the prescribed information with other information that was critical for effectively assessing the creditworthiness of a borrower. Although we treated the two sets of criteria as substitutable, in practice they may be complementary. The findings shown in Table 1 suggest that while decision makers were faithful to the spirit (they continued to cite more decision criteria in total than they cited before the new practice was introduced), they altered the features (over time, they cited fewer prescribed criteria and more ad hoc criteria) to accommodate to the task and context. The pattern of findings suggests that over time decision makers adapted the features of the practice (decision criteria used) to make the practice more effective, although we do not know whether decision makers' actions were conscious or based on insights gained through their experience in using the prescribed criteria over time.

In addition to providing insight into how practices are produced, our findings link decision outcomes with the mode of their production. One of the more surprising results of our study relates to the outcomes of using the prescribed decision criteria. Decision makers who used a greater proportion of prescribed criteria were less likely to change the risk rating from t-1 to t. At the same time, decision makers who used a greater proportion of prescribed criteria were more likely to downgrade the risk of the borrower in the following time periods. This finding suggests that loan officers who relied on the prescribed criteria made decisions that were less effective than those who did not. One plausible explanation is that by following the rules, decision makers took a shortcut that caused them to restrict their search, ignore discrepant information, or be automatic in their processing. Perhaps by encouraging the judicious use of information, the organization inadvertently encouraged decision makers to narrow their analytic frame and simply consider information that neatly fit into the organization's formal categories. Perhaps by sticking with the rules, decision makers became complacent about decisions and did not fully evaluate the borrower.

Combined, the results suggest that planned organizational change can be a powerful tool in changing the routine behaviors of individual decision makers and can increase the level of consistency and conformance in decision processes across organizational subunits, at least for a period of time. The results also demonstrate the complex hierarchy of factors that influence decision makers' behavior. However, the results provide a cautionary note in that they suggest that extreme pressures to standardize important, yet relatively complex, decisions may not work as intended. The findings highlight the challenges of designing decision systems.

One implication for organizations that want to increase decision-making consistency and predictability through formal decision practices is the need to be mindful of the untoward consequences that can occur. Our findings direct attention to the contextual elements that regulate how rules are followed, established, and changed. Perhaps a set of practices can be designed for some static decision problems in organizations. But, as this study shows, the more difficult challenge involves designing a system for more complex, imprecise, changing decision problems. Designers of decision-making systems, especially those targeted toward controlling information, need to be mindful that they cannot fully control practice, that decision makers are bound to adapt their practices over time, and

that decision practices must be sufficiently flexible to allow decision makers room to adapt as necessary (March 1987). Decision makers may make mistakes when they follow routine procedures in the face of changing conditions. Although, in theory, decision reliability is thought to be achieved through the use of formal decision rules, the singular focus on repeatability as the primary defining quality of reliability in traditional definitions fails to deal with the reality that decision makers face fluctuating conditions that are not always known in advance. Our ideas are consistent with others studying situation assessment in complex systems (e.g., Weick et al. 1999) who suggest that problem solvers must be opportunistic and flexible in their evidence collection and evaluation tactics to detect and evaluate new events and to revise their understanding of a situation.

Limitations and Future Research

There are four limitations to this study that need to be noted. First, earlier we remarked that the bank spent considerable time developing the prescribed decision process, and we assumed that the set of prescribed criteria included the information necessary to make a superior judgment. It is possible, however, that the prescribed criteria were inadequate for the task. Consequently, we cannot definitively conclude that the adverse consequences associated with the use of prescribed decision criteria are not simply because of the implementation of "poor decision rules." Interviews with top managers suggested that the organization went to great lengths to identify the most important and generalizable factors that lenders were to consider. Moreover, top management's continuing commitment to the prescribed decision process signifies that they continued to believe in the utility of the decision practice several years after it was introduced. Thus, it is highly probable that the pressures to consider these criteria led decision makers to allocate too much attention to these particular factors at the expense of other, perhaps more important but idiosyncratic, indicators of borrower health.

Second, like most studies in the social sciences, the factors included in this study provide only a partial explanation of the phenomenon. Undoubtedly there are other important factors (both individual and contextual) that affect the criteria decision makers use to make risky decisions.

Third, we analyzed a very specific type of decision within a single organization, which makes it hard to generalize our findings beyond this particular commercial lending organization. Future research should examine the degree to which the factors we explored influence decision-making behavior in other decision settings. Still, we believe that the results presented in this paper are interesting and represent a valuable step in investigating how aspects of the natural decision-making environment influence the information that decision makers use in making important decisions.

Finally, we assumed that the information decision makers cited for each decision reflected the criteria they actually used in making their risk-rating judgment. Although crude, our preliminary analysis suggested that the information reported was congruent with the information that drove the risk assessment. Of course, we have no way of knowing for sure that the criteria decision makers reported in their loan records reflect the actual criteria they used to make their judgments.

Several opportunities for future research follow from this study. First, future studies should consider the role of expertise and experience because these factors have been shown to be important not only in affecting the use of decision practices (experts are less likely to use them) but also in influencing decision outcomes (see Klein 1998). Second, we did not have data on the extent to which decision makers received feedback on their decision performance or the extent to which decision makers believed their performance would be enhanced by using the standard criteria. Laboratory studies (e.g., Arkes et al. 1986, Davis and Kottemann 1995) have shown these factors to be very important in affecting decision maker use of standardized decision practices and the consequent performance outcomes, so these factors should also be included in future field studies. Third, researchers studying group decision support systems (e.g., DeSanctis and Poole 1994, Tyre and Olikowski 1997) have studied how practices are changed through use, but they could build on our findings to better understand how contextual elements might shape the structuration process. Finally, in theorizing about the outcomes associated with prescribed practice, we discussed, but did not empirically examine, certain factors that we argued might mediate between practice and outcomes. For example, we argued that the use of a prescribed practice could result in cognitive inertia or automatic processing that could lead to poorer outcomes; yet in our model, we did not empirically examine these factors. A final direction for future research, therefore, would involve the articulation and empirical examination of the specific factors mediating relationships between the use of standard decision practices and decision effectiveness.

In sum, organizations often try to compensate for decision makers' limited cognitive abilities by creating standard decision-making practices. This assumes that decision makers will be rational in using prescribed practices

and neglects the situationally dependent nature of behavior. Our findings suggest that decision making is not simply a matter of individual choice, but is shaped by multiple factors. Our findings can inform both scholars and practitioners who are interested in understanding and improving decision making within organizations.

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Endnotes

[1]To assess the robustness of our findings, we conducted a supplemental analysis and tested the hypothesized relationships using hierarchical linear modeling (Hofmann 1997), but without controlling for autocorrelation. The results from this analysis were fundamentally consistent with the results using the repeated measures regression analysis. Results from this analysis are available upon request from the authors.

[2]We also tested for a possible curvilinear effect in Hypothesis 2. An alternative to the relationship hypothesized in Hypothesis 2 is that lenders who have developed close (long duration) trusting relationships with borrowers may be more likely to take idiosyncratic information about them into account to justify decisions that favor them (the borrowers). Thus, we tested to see if reliance on prescribed criteria rose and then fell as duration increased. Our additional analysis offered little support for this proposed relationship, although we are grateful to Senior Editor M. Scott Poole for alerting us to this possibility.

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