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STRUCTURING STRATEGIC PROBLEMS: ANTECEDENTS AND
CONSEQUENCES OF ALTERNATIVE DECISION FRAMES

By

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ABSTRACT

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Using a sample of 180 managers from 98 auto-supplier firms and guided by specific hypotheses, this study examined the processes that lead managers to evoke one frame of reference rather than another. The study investigated initial framing processes, the processes that lead managers to reframe a strategic problem, and the effects of those processes on strategic choices. Four decision frames were studied: opportunity, threat, strength, and weakness.

The results of the study indicated that the availability of distinctive data and, in particular, the extent to which the data suggested probable gains or losses were significant predictors of the managers' initial frame of reference. The relative accessibility of different frames of reference, however, was not correlated with the managers' evoked decision frame. When later presented with data inconsistent with their initial frame, managers were more likely to reframe and reinterpret the original data if those data had been equivocal than if they had been distinctive of a particular decision frame. Finally, the managers' evoked frame of reference influenced

their corporate-level strategy recommendations and intervened between the data they had received and the strategies they recommended.

The primary contribution of this study is that it has developed and tested a theoretical perspective that links the underlying processes that lead managers to evoke a particular frame of reference with their effect on managers' strategic decisions. It has shown that under some circumstances managers reframe strategic problems and evoke a new interpretation of "old" situations even when the data characterizing the "old" situation have not changed. Future research can build upon these findings by investigating additional factors that might influence the frames of reference managers evoke, and the effects of those frames of reference on a wider variety of strategic decisions.

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Dedicated to my father, wife, and daughters
and the memory of my mother

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Chapter 1

Introduction

A predominate characteristic of strategic decision making is the ambiguity of the problem to be solved. Strategic problems lack structure and are ill-defined, with problem formulation and resolution being determined extensively by the structure imposed on the problem by the decision maker (Mintzberg, Raisinghani, & Theoret, 1976). Consequently, a number of theorists (e.g., Chaffee, 1985; Daft & Weick, 1984; Dutton, Fahey, & Narayanan, 1983; Smircich & Stubbart, 1985; Walsh, 1988) have begun to call attention to interpretive processes inherent in strategic decision making. Some theorists have responded by examining cognitive biases (e.g., Barnes, 1984; Schwenk, 1984) and individual differences (e.g., Miller, Ket de Vries, & Toulouse, 1982; Sturdivant, Ginter, & Sawyer, 1985) that can influence the meaning managers attach to different strategic issues, whereas others have focused on the contexts within which strategic issues are analyzed (e.g., Dutton & Jackson, 1987; Fredrickson, 1985; Jackson & Dutton, 1987; Walsh, 1988).

This study attempts to further develop these efforts by examining decision framing processes and the consequences of alternative decision frames on managers' strategic choices. Specifically, this study will consider (a) the mechanisms that lead managers to initially frame a strategic decision in a particular way, (b) the mechanisms that later may lead managers to reframe previous strategic decisions, and (c) the effects of alternative decision frames on managers' strategic choices.

In exploring the mechanisms of framing and reframing both individual and contextual factors will be considered.

Decision framing processes are important since identical data, framed in different ways, can result in different managerial interpretations. For example, promotional activities by a competitor may be interpreted as competitive behavior if the firm's managers take a provincial frame of reference and assume that competitors' sales will rise at the expense of their firm's sales. In contrast, these same promotional activities can be interpreted as cooperative behavior if the managers take an industry frame of reference and assume that their firm's sales will rise along with overall industry sales. Variations in interpretations may, in turn, influence managers' strategic choices and have consequences for subsequent organizational outcomes (Dutton & Jackson, 1987; Fredrickson, 1985; Jackson & Dutton, 1987). For example, given a provincial frame of reference and a competitive interpretation, the firm's managers may respond defensively by cutting prices and, consequently, lowering the firm's profit margins. Alternatively, an industry frame of reference and a cooperative interpretation may lead the firm's managers to seek joint promotional activities, thus increasing their firm's sales and profit margins while reducing promotional costs.

Although framing effects have important strategic consequences, reframing adds a dynamic element to the understanding of how decision frames affect strategic choices. If managers' initial decision frames prove to be contradictory to forthcoming information or obsolete as a result of on-going environmental shifts, it may be necessary for them to

reframe the situation and consider an alternative interpretation (Smircich & Stubbart, 1985). However, managers often stick to their "old ways", even to the point of their own termination or their organization's demise (Nystrom & Starbuck, 1984). In some cases, reframing may be particularly problematic since the original conditions may remain unchanged while the managers' interpretation of them must change (Watzlawick, Weakland, & Fisch, 1979). Thus, managers who have interpreted a competitor's promotional activities as competitive may find it difficult to envision these same activities as cooperative even though such an interpretation may be advantageous for the organization, the industry, and their own careers.

In order to better understand the possible mechanisms influencing framing and reframing as well as their consequences on strategic choices, this study (a) reviews and critiques the current decision framing literature, (b) presents a Strategic Decision Framing Model with associated hypotheses and supporting literature, (c) describes the research methods used to test the model and hypotheses, (d) presents the results of that research, and (e) considers the implications the study findings have for strategic decision makers and future research examining strategic decision making processes.

Chapter 2

Literature Review

Decision Frame Construct

The "frame" construct has taken a prominent position in a number of sociological, social psychological, and psychological theories. Originally, Bateson (1955/1972), using a picture frame analogy, defined a frame as an arbitrary boundary that defines the context in which a particular action, event, or scene occurs and gives it meaning. "The frame around a picture ... says, 'Attend to what is within and do not attend to what is outside' ... [and] tells the viewer that he is not to use the same sort of thinking in interpreting the picture that he might use in interpreting the wallpaper outside the frame" (Bateson, 1955/1972, p. 187). In effect, the frame helps the observer to determine what the "figure" represents by demarcating the "ground" within which the "figure" may take on a different meaning. Given a different context or a change in context, the meaning of a particular action, event, or scene may be different.

Goffman (1974), adapting Bateson's perspective, equated frames with "schemata of interpretation" (p. 21) that render what would otherwise be meaningless into something that is meaningful. For the individual, frames represent "the principles of organization which govern events -- at least social events -- and our subjective involvement in them" (Goffman, 1974, p. 10). In effect, they organize our experience by telling us what is going on in a given situation and how to respond. For example, different frames of reference allow us to interpret and

respond to a murder observed as part of a nightly news broadcast quite differently than one observed during a movie. An inappropriate frame, in contrast, can readily lead to errors in interpretation such as occurred during Orson Welles' "Invasion from Mars" radio broadcast where a fictional event was mistaken for an actual event.

Minsky, taking a cognitive perspective, defined a frame as a memory "data-structure representing stereotypical situations" (1975/1981, p. 96) that contains information regarding use of the frame as well as what is likely to occur next. The frame guides the individual's attention, interpretation, and actions. Furthermore, since related frames are linked together to form frame systems, "different frames of a system describe the scene from different viewpoints" (Minsky, 1975/1981, p. 96). Thus, like his predecessors, Minsky suggested that alternative frames can lead to different interpretations of the same event or scene.

Kahneman and Tversky (1979, 1984; Tversky & Kahneman, 1981) used the term decision frame to refer to "the decision maker's conception of the acts, outcomes, and contingencies associated with a particular choice" and compared alternative frames to "alternative perspectives on a visual scene" (Tversky & Kahneman, 1981, p. 453). Further, they suggested that "changes in perspective often reverse the relative apparent size of objects and the relative desirability of objects" (Tversky & Kahneman, 1981, p. 453). In sum, changes in decision frames lead to changes in decision maker preferences and possibly decision outcomes.

Thus, each of the above theorists has proposed that a frame constitutes an organizing structure that gives a stimulus meaning by

directing attention toward some elements of the stimulus and away from others. Furthermore, since the individual can impose alternative but overlapping organizing structures on the same stimulus, the stimulus can be interpreted by the same individual in different ways. Within this study, a decision frame will be defined as an evoked cognitive structure that determines what data are relevant to a decision and how those data are to be interpreted.

While a decision frame is defined here as a cognitive organizing structure, decision-framing effects have typically been demonstrated by experimental manipulation of a problem stimulus (e.g., Kahneman & Tversky, 1979, 1984; Fredrickson, 1985). That is, experimenters have framed the experimental task from alternative perspectives such as maximizing profits or minimizing expenses (Schurr, 1987). Consequently, on the surface, it may appear that the frame is a characteristic of the stimulus. This is not the case. Decision framing effects, as suggested by the above conceptual definitions, are dependent on the evocation of cognitive representations that actually structure the stimulus. Thus, an experimental problem may be presented in different ways, but the structure imposed on the problem depends on the individual's "conception" (Tversky & Kahneman, 1981, p. 453) of the problem. In effect, decision frames, as cognitive organizing structures, mediate between the problem stimulus and the subsequent structuring and interpretation of the stimulus. In this respect, they are similar to March and Simon's evoked set, "that part of the memory that is influencing behavior at a particular time" (March & Simon, 1958, p. 10).

Cognitive Schema Construct

In order to fully understand the decision frame construct, a second construct, cognitive schema, must be considered. If decision frames are cognitive structures, as the above definition suggests, then assumedly they possess the general properties that have been associated with such cognitive structures. If so, explication of these basic properties can provide, at least initially, a conceptual framework for better understanding decision framing and reframing processes. Although specialized terms such as "cause maps" (Bougon, Weick, & Binkhorst, 1977; Weick, 1979), "scripts" (Gioia & Poole, 1984; Schank & Abelson, 1977), "categories" (Rosch & Mervis, 1975), "belief structures" (Walsh, 1988), and "templates" (El Sway & Pauchant, 1988) have been adapted to refer to distinct types of cognitive structures, the schema construct constitutes a superordinate construct, a general term used to describe the features and mechanisms by which cognitive structures function. Therefore, it seems reasonable to portray decision frames as cognitive schemata, endowed with the basic properties associated with schemata.

Schemata, originally defined by Bartlett (1932), are cognitive knowledge structures that represent organized knowledge about a given stimulus domain which are inductively derived from previous experience with the stimulus (Fiske & Taylor, 1984; Taylor & Crocker, 1981). They serve as "templates" or "formats" (Neisser, 1976) that guide attentional processes, determine how stimuli will be encoded, organized, stored, and retrieved for later processing, and provide interpretive frameworks that influence individual inferences and judgments (Fiske & Taylor, 1984; Markus & Zajonc, 1985).

Internally, the structure of a schema has been characterized as an organized set of interconnected variables (Crocker, Fiske, & Taylor, 1984; Minsky, 1975/1981; Rumelhart & Ortony, 1977; Thorndyke & Hayes-Roth, 1979) that represent the "normal" or expected pattern of association -- the prototypical model for the stimulus (Rumelhart, 1980). The variables within the schematic network, in turn, have been characterized as empty "slots" (Minsky, 1975/1981), "terminals" (Minsky, 1987), or "bins" (Wyer & Srull, 1980) that generally take on the values observed for the variable in the stimulus. If the stimulus value cannot be ascertained, a default value is used (Minsky, 1975/1981). Default values are the expected values associated with the variables derived from previous experience with the stimulus. Default values make it possible for individuals to interpret incomplete stimulus data (Thorndyke & Yekovich, 1980). Each variable slot, in addition, has constraint values that represent the range of possible values a variable slot may assume within a particular schema (Rumelhart, 1980). If the stimulus value exceeds the constraint values, an alternative schema may be triggered or the schema may be modified (Kuipers, 1975).

For example, a "swan" schema might consist of interconnected variable slots for physical attributes such as "neck length", "feather color", and "wing size" and behavioral attributes such as "locomotion" and "reproduction" as well as any other prototypical features associated with swans during past encounters. When a "swan" is observed in the water, the variable slots for "neck length" would take on a value "long", for "feather color" the value "white", and for "locomotion" the value "swimming". If the stimulus value for "wing size" cannot be

determined because the swan is "swimming", a default value, "large", will be used to fill the variable slot.

Individuals presumably have multiple schemata with overlapping variables slots (Fiske & Taylor, 1984; Markus & Zajonc, 1985). For example, "swan" and "duck" schemata may share variable slots for "neck length", "feather color", "wing size", "locomotion", and "reproduction". By comparison, "swan" and "airplane" schemata may share only a few variable slots like "wing size" and "locomotion" but not "feather color", "neck length" or "reproduction". In addition to common variables slots, the constraint values for the shared variable slots may overlap. Thus, "swan", "duck", and "airplane" schemata may all include "flying" as a value that falls within the constraint value for the "locomotion" variable slot. These comparisons further suggest that some schemata (e.g., "swan" and "duck" schemata) may be distinguished primarily by constraint value differences while others (e.g., "swan" and "airplane" schemata) may be distinguished primarily by variable slot differences.

This overlapping of variables and values is what makes it possible for the individual to evoke more than one schema in a given situation. For example, an individual who is shown a picture of a "white-feathered" object "swimming" with its "neck" in the water may evoke either a "swan" or a "duck" schema. Alternatively, if the stimulus is described as a "large-winged" object that "flies through the air", the individual may evoke either "swan" or "airplane" schemata. In either of these examples, the schema that is evoked will determine what other assumptions the individual makes about the object. That is, once the

schema is evoked other variable slots in the variable network will be activated and the associated default values will be assigned to those slots.

In addition to this horizontal structure, schemata are vertically structured with lower-level schemata being hierarchically embedded in higher-level schemata (Rumelhart & Ortony, 1977; Taylor & Crocker, 1981). In effect, the variables within a schematic structure constitute summary representations, unitized knowledge (Hayes-Roth, 1977) that is abstracted from lower-level variable networks. Thus, for the "swan" schema there are lower-level variable networks that characterize bills, feet, necks, and feathers. In addition, the swan and duck variable networks may be grouped with other similar networks to form a higher-order, "water-fowl" schema.

Unitization is a central characteristic of schema and refers to a condition where, after repeated encounters with a particular stimulus, the individual comprehends and treats a stimulus as a unified integrated phenomenon without necessary reference to the internal structure or initially invoked attributes of the stimulus (Rumelhart & Ortony, 1977; Thorndyke & Hayes-Roth, 1979). For example, after repeated encounters with swans, individuals can comprehend and manipulate the idea of a swan without necessity of attending to or recalling the specific variables and features that initially constituted their understanding of swans (e.g., long neck, white feathers, webbed feet, black bill). While unitization allows individuals to form and manipulate higher order concepts (e.g., swans), access and reference to the specific variables that constitute their concept is still possible as is access and

reference to the values associated with the variables. Besides being cognitively efficient, manipulation of larger "chunks" or units of knowledge make higher-order cognitive processing possible (Chase & Simon, 1973; Rumelhart & Ortony, 1977).

Given the earlier conceptual definition of decision frames, the above literature suggests a number of properties that decision frames may possess. First, the internal structure of decision frames, if they are cognitive structures, assumedly consists of unitized networks of variable slots derived from past experience with the variable slots taking on stimulus or default values. Second, multiple decision frames, because they have overlapping variable slots and constraint values, may be applied to the same stimulus and result in varying interpretations of the stimulus. Third, in terms of vertical structure, decision frames are likely to constitute superordinate, hierarchically dominant cognitive structures within which lower level schema are embedded (Dutton & Jackson, 1987).

In summary, decision frames will be conceptualized here as evoked cognitive structures that determine which data are relevant to a decision and how those data are to be interpreted. Furthermore, as cognitive structures, they will be assumed to possess the basic properties of cognitive schemata as described above.

Empirical Research on Decision Framing

Decision Framing Consequences. Kahneman and Tversky (1979, 1984; Tversky & Kahneman, 1981) were the first to apply and examine the effects of "frames" in a decision making context. Using normative decision making criteria, they argued that framing problems with the

same probability distributions in negative (e.g., 20% chance of losing) or positive (e.g., 80% chance of winning) terms should not affect individual preferences. For example,

Problem 1: Imagine that the U.S. is preparing for the outbreak of an unusual Asian disease, which is expected to kill 600 people. Two alternative programs to combat the disease have been proposed. Assume that the exact scientific estimate of the consequences of the programs are as follows:

If Program A is adopted, 200 people will be saved.

If Program B is adopted, there is a $1/3$ probability that 600 people will be saved, and a $2/3$ probability no people will be saved.

Which program would you favor?

Problem 2:

If Program C is adopted 400 people will die.

If Program D is adopted there is a $1/3$ probability that nobody will die, and a $2/3$ probability that 600 will die.

Which program would you favor? (Tversky & Kahneman, 1981, p. 453)

In the above problems, all four programs are mathematically equivalent. However, Programs A and C represent certain choices while Programs B and D represent risky choices. Furthermore, Programs A and B are framed positively (i.e., gains) while Programs C and D are framed negatively (i.e., losses). According to Kahneman and Tversky, since both problems are equivalent, there should be invariance in individual preferences across the problems. However, subjects in their study selected Program A (72%) in Problem 1 and Program D in Problem 2 (78%). Since Programs B and D represent riskier choices, Tversky and Kahneman (1981) concluded that a negative frame (i.e., loss) generally leads to risk-seeking

behavior and a positive frame (i.e., gain) generally leads to risk-averse behavior when compared to rational criteria. These variations in risk preferences, as formalized in Kahneman and Tversky's Prospect Theory (1979), are supposedly due to (a) individuals' evaluating outcomes as losses or gains relative to their current status, and (b) individuals' assigning greater value to losses than equivalent gains.

Recently, organizational researchers have applied Prospect Theory to a variety of organizational problems. Neale and Bazerman (1985), for example, used Prospect Theory as a framework for examining negotiator behavior. In a role-playing task, they found that individuals who were provided with negotiation conditions framed negatively were less concessionary and their financial performance was less successful than individuals who were provided positively framed negotiations. If one assumes that less concessionary behaviors are more risky, these observations are compatible with Prospect Theory. In a related study examining negotiations between groups provided positive frames (i.e., chance of net profits/unit) and negative frames (i.e., chance of expenses/unit), Schurr (1987) found that the positively framed outcomes led to less risky bargaining agreements than negatively frames outcomes.

Huber, Neale, and Northcraft (1987) have also applied Prospect Theory to personnel selection. With a sample of students, they found that framing a selection interview decision as an "acceptance" as opposed to a "rejection" decision led subjects to select fewer applicants for interviewing. This effect, however, only occurred when selection-related costs were made salient.

Prospect Theory has also received recent attention as an alternative explanation for decision maker's willingness to commit additional resources to failing courses of action (Staw, 1976, 1981). Bazerman (1984), for example, argued that negative framing contributed to escalation behavior since the experimental stimulus used in escalation studies typically framed the problem negatively. Alternatively, Whyte (1986) argued that the negative feedback provided by unsuccessful projects might evoke a negative frame for future resource allocation decisions regarding failing projects. These negatively framed allocation decisions, in turn, would likely be accompanied by inappropriate risk-seeking behavior and, consequently, a disproportional commitment of funds. Furthermore, Whyte points out that Prospect Theory "can be applied to an analysis of escalating commitment in the context of both failure and success" (1986, p. 319), while the original self-justification explanations (Fox & Staw, 1979; Staw, 1976) only apply to escalation of commitment in failing situations.

Researchers have demonstrated the effects of negative and positive feedback on escalation behavior in three empirical studies. Davis and Bobko (1986) provided positively and negatively framed feedback to subjects regarding an Employability Development program (i.e., 39% placed in jobs versus 61% not placed in jobs). They found that when the feedback was framed negatively, resource allocation patterns were consistent with previous escalation research; this was not so when the feedback was framed positively.

Bateman (1986), in contrast, manipulated feedback success or failure (i.e., study improvement in earnings versus continued decline in

earnings) and probability of future success (30% versus 70%). His results indicated a main effect for probability of success but not for success/failure feedback. However, there was a significant interaction between success/failure feedback and probability of success. Specifically, subjects who received failure feedback and low probability of success allocated lower funds to a project than any other group (9.08), while subjects who received failure feedback and high probabilities of success allocated the highest funds (13.56). Probability of success had no effect on allocations for subjects receiving success feedback (11.12 and 11.58).

In a related study, Bateman and Zeithaml (1989) manipulated failure versus success feedback and positive versus negative decision frames (i.e., chances of future success or failure). While they found main effects for both feedback and decision frames, they also found a two-way interaction similar to that reported by Bateman (1986). Specifically, a positive decision frame coupled with initial failure feedback resulted in significantly higher levels of investment than in any other context. They concluded that "the positive frame, therefore, appeared to activate or exaggerate the potential effect of failure feedback ..., leading decision-makers in these negative contexts to invest larger amounts" (Bateman & Zeithaml, 1989, p. 69).

While the above empirical studies generally support the conclusion that decision framing may underlie escalation behavior, the mere presence of negative feedback, as suggested by Whyte (1986) and Bazerman (1984), may not be a sufficient cause for escalation. For example, negative feedback coupled with a low probability of future success seems

to lead to de-escalation (Bateman, 1986; Bateman & Zeithaml, 1989) rather than escalation. That is, commitment to failing projects only seems to occur when the decision maker expects future success. Furthermore, since the failure feedback can be framed either positively or negatively, the framing of the feedback should be treated independently of its value relative to some specified criterion. Thus, escalation seems most likely to occur when the decision maker receives negatively-framed failure feedback and has high expectations about future success of the project.

Decision Framing Mechanisms. In addition to studies examining the consequences of decision frames, other researchers have attempted to identify the mechanisms that underlie decision-framing effects. In a study examining decision framing with incomplete information (i.e., only outcome probability or reward level information), Levin, Johnson, Russo, and Deldin (1985) found that missing probability information led to lower ratings relative to problems with complete information (i.e., probability and reward information) in positively framed conditions but higher ratings in negatively framed situations. However, there was no observed difference between positively and negatively framed conditions when reward level information was missing. Consequently, they concluded that missing information has a differential impact depending on how the situation is framed.

In a follow-up study, Levin et al., (1986) found that decision-framing effects were due to differences in the relative scale value associated with the likelihood of a gain versus a loss, rather than the value associated with the outcomes. Consequently, they concluded that

biases associated with the subjective weights assigned to the probabilities, rather than biases in the value attached to the outcomes, cause decision-framing effects. In addition, they suggested that, in the absence of pay-off or probability information, subjects may "impute a value to the missing information based on the previous experience" (Levin et al., 1986, p. 63).

Northcraft and Neale (1986) also found evidence that information-processing differences may explain decision-framing effects. They argued that differences in the salience of out-of-pocket costs and opportunity costs in a "loss" situation might lead managers to continue to commit funds to failing projects, since managers might interpret the decision as a choice between a certain loss and the possibility of no losses. In fact, their results showed that when opportunity costs are made salient, subjects' decisions generally meet normative decision-making criteria.

While the decision framing literature has typically assumed that equivalent data framed differently leads to variance in risk preferences, the results of studies by Levin et al. (1986) and Northcraft and Neale (1986) suggest that the information actually brought to the decision may, in fact, not be equivalent. As mentioned previously, the framing process depends on the evocation and imposition of internal cognitive representations on the stimulus. Characterizing decision frames as schemata, as mentioned, suggests that equivalent stimuli presented from alternative perspectives may activate different, though overlapping, variable networks. These alternative variable networks, however, are not identical. Thus, other informational inputs

considered relevant to the decision may vary even though the activating stimuli are essentially equivalent. These other informational inputs may be represented by decision makers' assumptions and expectations as reflected in the different variable networks and default values associated with the alternative but overlapping decision frames.

Empirical Research on Strategic Decision Framing

Strategic Decision Framing Consequences. As noted earlier, strategic problems are generally considered to be highly ambiguous and uncertain. Thus, decision makers may not be able to apply routine solutions and, instead, may find it necessary to structure each problem themselves (Mintzberg et al., 1976). The problems typically do not come pre-formulated and the solutions do not come pre-packaged. Furthermore, the structuring of these "messy" (Ackoff, 1974) problems depends heavily on the decision makers' assumptions (Mason, 1969; Mitroff & Emshoff, 1979) with those assumptions often being reflected in the decision makers' frame of reference. Because of this, a number of organizational researchers have suggested that decision-framing effects may be especially critical in a strategic decision making context (Dutton et al., 1983; Dutton & Jackson, 1987; Fredrickson, 1985).

Of particular interest to researchers examining strategy formulation have been the effects of "problem", "crisis", and "opportunity" decision frames on strategic decision making routines and outcomes (Mintzberg et al., 1976). Meyer (1982), while examining hospital administrators' responses to an "environmental jolt" in the form of a physicians' strike, observed that some administrators saw the strike as a crisis while others saw it as an opportunity. These

alternative perspectives, in turn, led to decidedly different strategic responses and outcomes. For example, one hospital, whose administrator interpreted the strike as a crisis chose to "weather-the-storm" and suffered substantial financial losses. Another hospital whose administrator saw the strike as a "good experiment" adapted internal operations quickly and actually made a profit during the strike. Given these diverse responses, Meyer concluded that "environmental jolts" are ambiguous events whose interpretation is, in large part, the consequence of organizational ideology which he defined as the "constellation of shared beliefs that bind values to actions" (p. 522).

In a study examining participatory decision processes, Tjosvold (1984) examined the effects of "crisis", "challenge", or "minor issue" decision frames on the extent to which managers would seek subordinate input into decision making processes. Using a sample of managers and three case simulations with different framing information embedded in each case, Tjosvold found that managers with "crisis" frames were less open to subordinate input than were managers with a "challenge" perspective.

Dutton (1986), in an exploratory study examining the processing of five strategic issues within a single organization, found evidence that "decision-makers expend greater resources, centralize authority and generate a greater volume of causal explanations during the processing of crisis versus non-crisis strategic issues" (p. 501). Crisis strategic issues were characterized as critically important issues involving some time pressure and uncertainty associated with the outcome. While her study was not presented explicitly as a study in

framing effects, the results suggest that strategic issues framed as crises will result in decision making processes and outcomes different from those framed as non-crises.

In contrast, Fredrickson (1985) empirically tested the effects of framing a decision as a "problem" or "opportunity" on strategic decision making processes. Using a sample of MBA students and a case with paragraphs indicating the situation was either a "problem" or an "opportunity", Fredrickson found that a "problem" frame resulted in more comprehensive strategic plans which encouraged outsider participation, while an "opportunity" frame resulted in less comprehensive plans. His results, however, did not hold for a second sample of upper-middle level executives. While the manipulation check for the sample of executives indicated that the frame manipulation had been effective, there were no significant differences in their recommended actions. Consequently, Fredrickson concluded that strategic decision-making processes preferred by executives may be relatively unaffected by these contextual factors which he examined.

Fredrickson's (1985) results suggest the possibility that strategic decision frames may influence the strategic choices of inexperienced decision makers but not experienced decision makers. In contrast to his results, Tversky and Kahneman's (1981) research has demonstrated that positive and negative frames consistently affect risk preferences of both experts and novices. Thus, the unexpected results reported by Fredrickson (1985) may be the consequences of the strategic actions he chose to examine rather than reflections of a universally non-

significant relationship between managers' interpretations and their subsequent strategic choices.

Strategic Decision Framing Mechanisms. Since, as suggested here, the framing of a strategic decision involves the activation and imposition of a cognitive structure on an otherwise ambiguous strategic problem, the mechanisms and variables that lead the decision maker to evoke one strategic decision frame rather than another may be particularly important. If the mechanisms and variables that affect their operation can be identified, perhaps we can then begin to understand why decision makers structure strategic problems the way they do. In this vein, organizational researchers have recently begun to consider possible strategic decision framing mechanisms.

Dutton and Jackson (1987), in particular, proposed a model and hypotheses which incorporate categorization theory (Rosch & Mervis, 1975) to explain the processes that lead decision makers to evoke alternative strategic decision frames (e.g., threat versus opportunity). They argued that attributes of a situation or issue lead the manager to categorize the situation and frame the strategic decision one way rather than another -- for example, as a "threat" rather than as an "opportunity". Regarding specific attributes, they suggested that opportunities are characterized by a "positive" situation where a "gain" is likely and where the manager has a fair amount of "control". Threats, in contrast, are characterized by "negative" situations where a "loss" is likely and there is little "control". They further hypothesized that once a category is selected subsequent managerial information processing will be biased toward confirmation of the

selected category. For example, when information is missing, the decision maker will assume the information is congruent with the way the strategic issue has been categorized. In addition, labeling a situation as a "threat" or "opportunity" was also suggested to influence communication and participatory processes in the organization as well as the direction and magnitude of the organization's response to the issue.

In a preliminary test of their model, Jackson and Dutton (1988) first attempted to identify the attributes that characterized "threats" and "opportunities" using a sample of general managers and strategic planners. As hypothesized, attributes that most differentiated threats from opportunities were "loss/gain", "negative/positive" and "non-control/control". However, other attributes were found that were common to both "threats" and "opportunities" (e.g., "major issue") as well as ones that were distinctive of one decision frame but not the other (e.g., "a crisis"). Given this asymmetry in attributes, they concluded that the two decision frames did not necessarily represent opposites on a single continuum.

In a second study, using a sample of MBA alumni, they manipulated presentation of distinctive and ambiguous attribute information within eight issue-based scenarios to determine whether the presence of the attribute information would affect how the individuals framed the issues. Their results showed that the attribute information led subjects to describe the situations as hypothesized. That is, when the subjects were provided with attribute information distinctive of a threat, the subjects reported that the issue represented a threat. They also found a significant interaction between the attribute information

and the scenarios. However, since the eight scenario issues and the order of presentation were confounded, they could not determine whether this interaction was due to order effects or the issues. They had used multiple issues because they felt the effects of the attribute information would generalize across diverse issues.

In summary, recent investigations applying decision framing to strategic choices have been fruitful. The above studies have shown that the frame of reference a manager takes does affect the manager's interpretation of the problem and in some cases may affect the manager's subsequent strategic choices. In addition, work by Dutton and Jackson has begun to identify the underlying mechanisms that explain why managers evoke a particular frame of reference when faced with a strategic problem.

Decision Reframing

If decision framing takes place through the activation of a cognitive structure that leads to one interpretation of a situation, then decision reframing involves the subsequent activation of an alternative cognitive structure that leads to an alternative interpretation of the original stimulus. This perspective is similar to that suggested by other theorists. For example, Watzlawick et al. (1974) suggested that reframing "means to change the conceptual and/or emotional setting or viewpoint in relation to which a situation is experienced and to place it in another frame that fits the same 'facts' of the same concrete situation equally well or even better, and thereby changes its entire meaning" (p. 95). Likewise, Bandler and Grinder

(1982) defined reframing as "changing the frame in which a person perceives events in order to change the meaning" (p. 1).

While cognitive change can occur through a number of mechanisms, reframing represents a unique type of cognitive change. First, reframing involves second-order change processes. Second-order change is "change of change" (Watzlawick et al., 1974, p. 11), often represented as a radical, discontinuous shift from one set of interpretive rules to another set (Bartunek, 1984; Bartunek & Moch, 1985). In contrast, first-order change is "one that occurs within a given system which itself remains unchanged" (Watzlawick et al., 1974, p. 10). Thus, first-order change is change within the existing frame of reference while second-order change is a change from one frame of reference to another.

Reframing, as a second-order change, is not dependent on other exogenous changes. That is, the individual's frame of reference can change even though the original conditions remain unchanged. Thus, reframing differs significantly from the interpretive changes that most organizational theorists have examined -- interpretive changes that are typically triggered by exogenous changes. For example, Tushman and Romanelli (1985), in their model of organizational evolution, suggested that interpretative changes, which they refer to as re-orientations or re-creations, are initiated by exogenous forces including declining organizational performance, changes in product design, changes in technology, or shifts in intraorganizational power. Likewise, Ranson, Hinings, and Greenwood (1980) and Bartunek (1984) have argued that changes in organizational structure, another exogenous force, initiate

changes in individual interpretive schemes. The interpretive shifts in both the above examples do not appear to be the consequence of shifting frames per se, but of shifting conditions. According to Watzlawick et al., reframing is a problem in reclassification. That is, "reframing means changing the emphasis from one class membership of an object to another, equally valid class membership (Watzlawick et al., 1974, p. 98). Reclassification does not require a change in the original "facts".

Reframing, however, does seem to require, at least temporarily, a shift in levels of interpretation. That is, in order to move from one frame of reference to another, the individual must activate a higher, meta-level interpretation that embodies the alternative interpretation (Watzlawick et al., 1974). Once the alternative frame of reference is evoked, the individual may, however, return to a lower-level but alternative interpretation. In fact, Watzlawick et al. (1974) have suggested that once a new frame is activated, the individual may find it difficult to go back to the former interpretation. The assumed hierarchical shift that occurs during reframing is consistent with the earlier discussion regarding the vertical structure of schemata.

Finally, the above points suggest the importance of distinguishing reframing from a third type of cognitive change -- learning. Reframing is not learning per se. Reframing, as described above, implicitly assumes that the individual already has available an alternative frame of reference. In contrast, learning models typically assume that the frame of reference is somehow incomplete or requires modification (Hedberg, 1981). Given the earlier description of schemata, learning

would involve either the addition or deletion of variable slots from the variable network, or changes in the variable constraint values. El Sway and Pauchant (1988) exemplified this learning perspective when they portray "shifts in frames of reference" as "twitches" involving the deletion, merging, branching, or modification of constructs within a manager's frame of reference. Reframing, on the other hand, requires no modification to the variable network or the constraint values, but does require the activation of an alternative schema with variable slots that overlap with the prior decision frame and fit the stimulus equally well.

Gaps in Existing Research

While organizational scientists have demonstrated an on-going interest in framing effects on decision making processes and outcomes, a number of important gaps are evident in the current research. In particular, research has failed to adequately address three issues: (a) why managers impose specific decision frames on particular problems, (b) how ambiguous or inconsistent data affect decision framing processes, and (c) what factors lead managers to reframe prior decisions.

First, existing research has focused extensively on the effects of alternative decision frames, but has paid little attention to the processes that lead decision makers to evoke a particular decision frame in a given situation. For example, we know the effects of negative and positive decision frames on risk preferences, but have little idea as to why or when a manager might evoke either of these decision frames. As mentioned, these antecedent conditions may be especially important given the ambiguous nature of strategic problems (Mintzberg et al., 1976).

Recent efforts by Dutton and Jackson (1987; Jackson & Dutton, 1988) have begun to identify some of those antecedent conditions.

Second, researchers have not considered the effects of ambiguous or inconsistent stimulus data on decision framing processes. In fact, the experimental manipulations in the above studies have generally used an unambiguous decision frame stimulus to insure that the frame manipulation is effective. Unfortunately, the stimuli managers actually encounter are inconsistent, incomplete, and ambiguous. In the real world, there is no "experimenter" to provide a single, explicit, uniform frame of reference. Decision makers frame strategic problems themselves. As pointed out by Mintzberg et al. (1976), the strategic problems managers encounter must first be structured by them and this structuring process may be determined, in large part, by the cognitive processes that control activation of alternative decision frames.

Finally, although organizational scientists have investigated changes in interpretive schemata, they have focused almost exclusively on interpretive shifts that are triggered by exogenous forces. Furthermore, they have generally examined interpersonal interpretive reorientations; that is, changes in interpretations shared by organizational members (e.g., Bartunek, 1984; Leblebici, Marlow, & Rowland, 1983; Ranson et al., 1980). Thus, researchers have not examined reframing explicitly nor have they examined cognitive reorientations in an individual decision making context. Moreover, while considerable attention has been given to initial framing processes, reframing processes may be equally important and perhaps even more problematic than initial framing processes. If framing is

important because different frames result in alternative interpretations of the same situation, then reframing is important because it suggests that decision makers can change their interpretation of the situation even though the situation does not change. In the absence of reframing, managers are likely to perpetuate faulty assumptions and apply ineffectual solutions to organizational problems with minimal success and eventual failure (Nystrom & Starbuck, 1984). Thus, examination of the cognitive processes underlying reframing may provide important insights into the conditions that might provoke the adoption of alternative frames of reference.

Chapter 3

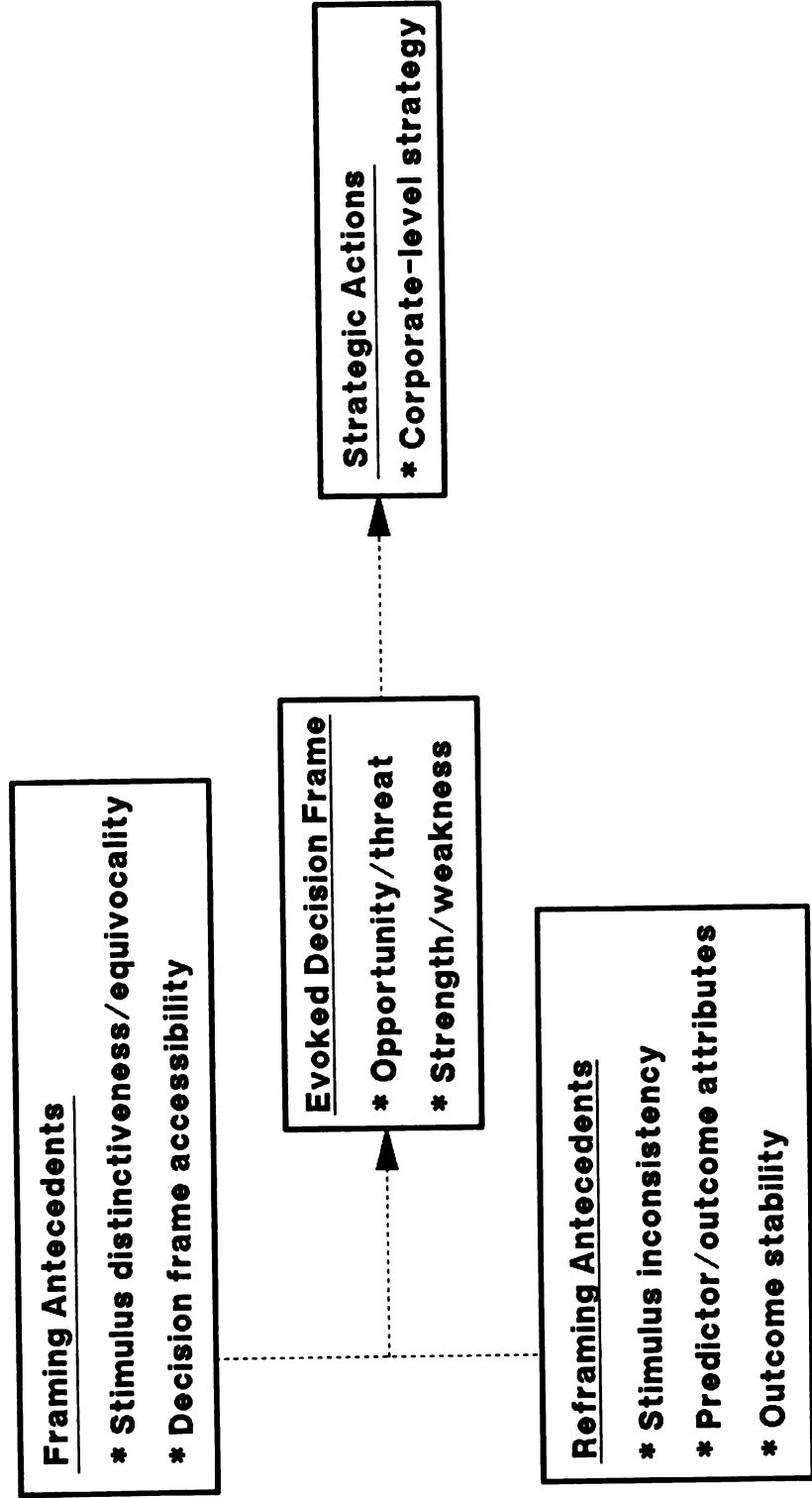
Strategic Decision Framing Model

The framing of a strategic decision, as conceptualized here, involves the evocation of a decision frame which determines what data are relevant to the decision and the meaning of those data. As a schematic variable network, a decision frame provides a distinct organizing structure for an otherwise amorphous stimulus. Once evoked, the decision maker interprets the organization's situation in terms of the variable network associated with the evoked decision frame. Specifically, variable slots take on the values observed in the stimulus or default values if stimulus data are not present. The evoked decision frame, in turn, influences the manager's strategic actions. Although the decision frames considered here, opportunity/threat and strength/weakness, may influence various strategic choices, this study will consider their effects on corporate-level strategy.

Processes, variables, and hypotheses associated with the model are described in the following sections. The presentation is organized around the model shown in Figure 1.

Figure 1

Strategic Decision Framing Model



Antecedents to Framing

In a manner similar to Dutton and Jackson (1987), the initial framing of a strategic decision, through the evocation of a decision frame, will be considered from a cognitive categorization perspective (Rosch & Mervis, 1975). According to categorization theory, individuals classify objects and events primarily as a function of the number of attributes the object shares with the prototypical object (Lingle, Altom, & Medin, 1984; Medin & Smith, 1984; Mervis & Rosch, 1981; Rosch, 1978; Rosch & Mervis, 1975). The activation of a decision frame, portrayed here as a schema, involves the sequential matching of available stimulus data with the variable slots within the decision frame. Once an acceptable fit is encountered, initial activation processes are concluded. A second factor, decision frame accessibility, determines the readiness with which the available decision frames are accessed and evaluated regarding their "goodness-of-fit" with the stimulus data. In effect, more accessible decision frames are evaluated prior to less accessible ones.

Stimulus Distinctiveness/Equivocality. Stimulus distinctiveness will be conceptually defined here as the extent to which the available stimulus data are unique to one decision frame. Distinctiveness can be based on (1) the presence of unique variable slots (i.e., variable slots that do not overlap with other schema), or (2) the presence of non-overlapping constraint values for shared variable slots. Figure 2 graphically portrays this conceptual definition for both variable and value distinctiveness.

In the figure, the stimulus has a variety of attributes or features (e.g., a, b, ... n) that can take on different values, while the alternative schemata have variable slots (e.g., brackets) for some stimulus attributes but not others. In addition, each variable slot has associated with it constraint values (e.g., the values within the brackets) which may or may not be distinctive. Thus, a swan schema might have variable slots for attributes a, b, c, and d, while an airplane schema might have slots for attributes a, b, e, and f. Alternatively, swan and duck schemata might have identical variable slots, but some of the slots might have unique, non-overlapping constraint values. Thus, airplanes have a number of distinctive variable slots that can be used to distinguish them from swans and ducks, while swans and ducks are primarily distinguished from each other in terms of distinctive constraint values for their common variable slots. So, if the stimulus contains data associated with attribute "c", "neck length", and a value of "7" is observed, the stimulus will be considered distinctive of a swan. Alternatively, if the stimulus presents data for attribute "e" with a value of "4", it would be considered distinctive of an airplane.

Figure 2

Stimulus Distinctiveness and Equivocality

Stimulus Attributes							
Schema	a	b	c	d	e	f	...
Swan	[1-5]	[3-4]	[5-9]	[1-9]			n
Airplane	[1-9]	[5-8]			[3-6]	[2-7]	
Duck	[1-3]	[3-8]	[1-4]	[1-9]			

Stimulus equivocality will be conceptually defined here as the extent to which the available data fit more than one decision frame. In contrast to stimulus distinctiveness, stimulus equivocality can occur only when there is a simultaneous overlap in variable slots and constraint values for the overlapping variable slots. Thus, if the stimulus contains data for attribute "a", "flight speed", with the value "3", the stimulus will be considered equivocal in distinguishing between swans, ducks, and airplanes. However, if the value for attribute "a" was "7", the stimulus would be considered distinctive of an airplane, while a value of "4" would still be equivocal in distinguishing swans from airplanes. While stimulus equivocality requires overlapping variables and values, a stimulus which lacks value data may also be considered equivocal so long as the constraint values for the associated variable slot overlap. For example, if the stimulus indicates that the object has wings and flies but does not indicate the speed of flight, it may still be considered equivocal by the observer since the constraint values overlap.

A simplifying assumption in the above conceptual definitions is that the number of decision frames and attributes that will be considered in this study only represent a small portion of the possible decision frames and attributes. Consequently, any of the attributes considered unique to one decision frame used in this study may actually be represented in other decision frames that are not considered within this study. However, this assumption seems reasonable, since the purpose of this study is to identify these factors that lead decision makers to evoke one of a limited set of alternative decision frames.

Decision Frame Accessibility. In the cognitive literature, schema accessibility has been defined as the readiness with which a particular schema is used in information processing (Higgins & King, 1981). In contrast, schema availability has been defined simply as the presence of a particular schema within the person's memory (Bruner, 1957; Tulving & Pearlstone, 1966). In effect, the individual has "available" a number of schemata, but at any given time some of these available schemata are more "accessible" than others.

Accessibility has been conceptualized in one of two ways. The first focuses on the chronic, long-term, habitual use of certain schemata in the processing of social information (e.g., Higgins & King, 1981; Higgins, King, & Mavin, 1982; Higgins & Wells, 1986; Bargh & Thein, 1985), while the second focuses on temporary, short-term differences in accessibility due to recency or frequency of schema activation (Bruner, 1957; Srull & Wyer, 1979, 1980). Chronically accessible schema have typically been measured through free recall tasks where subjects are asked to list traits of people they like, dislike, seek, and avoid (e.g., Bargh, Bond, Lombardi, & Tota, 1986; Higgins et al., 1982). The initial responses to each question are considered to represent the most accessible trait categories. Temporary accessibility, in contrast, has generally been created through experimental manipulation of the frequency, recency, and duration with which various schemata are activated (Bargh et al., 1986; Srull & Wyer, 1979, 1980). Since the output primacy of chronically accessible schemata is, in large part, the consequence of frequent and extensive schema activation, these two perspectives are interrelated and

interdependent (Higgins & King, 1981). Research by Bargh et al. (1986) has demonstrated that both chronic and temporary sources of accessibility have essentially equal and additive effects. Within this study, decision frame accessibility will be conceptually defined in terms of the decision maker's chronic decision frame.

Empirical research has shown that schema accessibility occurs with both concrete and abstract constructs and can influence recall accuracy and creative problem solving performance (e.g., Higgins & Chaires, 1980; Higgins et al., 1982; Isen, Shaker, Clark, & Karp, 1978; Srull & Wyer, 1979, 1980). Furthermore, since accessibility effects seem to occur during initial encoding (Srull & Wyer, 1980), the initially activated schema may influence future judgments even though other schemata may be more accessible when those judgments are actually made. Finally, activation of more accessible schemata is essentially an automatic cognitive process, although individuals may have some indirect control over which schemata are more accessible as a result of consciously increasing the frequency and recency of their activation (Bargh, 1984; Bargh et al., 1986; Bargh & Pratto, 1986; Higgins et al., 1982).

As indicated earlier, both categorization and accessibility factors play an important role in evoking a particular decision frame. However, their relative importance depends on the distinctiveness of the stimulus data. Using the example of a swan schema, if the white-feathered object we observe flying in the sky has a long neck, a distinctive feature previously observed only in swans, we will evoke a swan schema irrespective of its accessibility relative to other schemata. However, if the stimulus provides highly equivocal data such as a flying object

with wings, which could be indicative of either swans, ducks, or airplanes, the relative accessibility of the swan, duck, and airplane schemata will determine which is activated. If the swan schema is more accessible, we will initially evoke a swan schema. In essence, the more distinctive the available data, the less accessibility will determine which schema is evoked.

Given the suggested equivocality of strategic problems (Ackoff, 1974; Mintzberg et al., 1976), the accessibility of different decision frames may play a particularly prominent role in determining which decision frame the manager evokes. Almost all studies examining schema accessibility effects have used an equivocal stimulus -- one that can be interpreted in more than one way. In fact, Srull and Wyer (1979) found that the interaction between the ambiguity of the stimulus and the accessibility of different traits accounted for approximately 70% of the variance in subjects' trait ratings. Since an equivocal stimulus can "fit" any number of schemata, there is a greater probability that the decision maker will evoke that decision frame with the greatest output primacy (Higgins & King, 1981).

Given the above conceptual framework, the following hypothesis concerning the initial framing of a strategic decision is proposed.

- H1: The decision frame a decision maker initially evokes will be a function of the distinctiveness of the data and the relative accessibility of the decision frame.
 - H1a: Distinctive attribute data will result in the decision maker evoking the decision frame associated with the distinctive data.
 - H1b: Equivocal data will result in the decision maker evoking the more accessible decision frame.

Antecedents to Reframing

As previously mentioned, reframing is a second-order change process that involves the activation of an alternative cognitive structure that leads to the reinterpretation of the original stimulus. Furthermore, since reframing is not dependent on changes in the original "facts", it is quite distinct from first-order cognitive-change processes which are instigated and influenced by exogenous changes (Watzlawick et al., 1974). As with decision framing processes, the schema construct will provide an underlying foundation for examining and contrasting reframing with first-order cognitive change processes.

If decision frames are schemata, then some overlap in decision frame variable slots and constraint values would appear to be a necessary condition for any shift in decision frames, whether triggered by exogenous changes or not. If there were no overlap, then the original conditions would be completely unrelated to the supplemental data and the initial interpretation would not change. In addition to overlapping variables and values, the presentation of supplemental data which are inconsistent with the evoked variables and constraint values would appear to represent a second necessary condition (Markus & Zajonc, 1985). That is, so long as the data the decision maker has present are not inconsistent with the evoked decision frame, the decision maker is likely to continue to interpret that situation using that decision frame.

While any shift in cognitive structures presumably requires supplemental inconsistent data and overlapping variable networks, various characteristics of the supplemental data may have a differential

effect on whether alternative decision frames are evoked. Some inconsistent data may affect a decision maker's frame of reference, while other inconsistent data, because they go unnoticed, may have no effect. Furthermore, the equivocality of the original data may determine whether supplemental inconsistent data will lead to first- or second-order cognitive change. If the original data are distinctive of a particular decision frame, then the initial interpretation can only change if those original data are somehow negated. On the other hand, if the original data are equivocal, that is, they fall within the overlapping variable slots and constraint values, the decision maker can readily shift from the initial decision frame to a complementary frame which also fits the original data. In addition, since supplemental inconsistent data are present, the decision maker will also evoke an opposing decision frame -- the decision frame that fits the supplemental inconsistent data. While first-order cognitive change does not result in activation of the complementary decision frame, it does lead to activation of the opposing decision frame. However, in this case activation of the opposing decision frame is much more tenuous since it is dependent on the extent to which the supplemental inconsistent data nullify the original data. Hypotheses designed to test the merits of the above argument are presented in the following sections.

Stimulus Inconsistency. Stimulus inconsistency will be conceptually defined here as the extent to which the observed value of supplemental data for overlapping variable slots is unique to a non-activated decision frame. Following our example in Figure 2, if the individual has evoked a swan schema, a stimulus with c=3 would be

considered inconsistent. A consistent stimulus, on the other hand, will be defined as an observed stimulus value that falls within the constraint values of the evoked schema. Thus, in Figure 2, c-6 would be consistent with a swan schema.

Although not considered in this study, stimulus inconsistency may also occur as a result of non-overlapping variable slots. For example, the individual who is informed that the observed flying object has wheels (e.g., e-4), when a swan schema was initially evoked, will consider that data inconsistent with the swan schema. This, in turn, may lead to a shift in schemata.

However, most social situations can be assigned to more than one category simultaneously and may be described at the same time in more than one way. For example, if we have attribute data concerning an individual that results in the evocation of a shyness schema, supplemental attribute data indicating the person is intelligent would not be considered inconsistent with our original interpretation even though the variable network for the shyness schema may be quite distinct from the variable network for intelligence. In cases such as this, the data are neither consistent nor inconsistent, but simply "not inconsistent". Thus, within this study inconsistency will be defined specifically as shared variable slots with non-overlapping constraint values.

Since schema-inconsistent data are assumed to be a necessary condition to all schema change processes, all subsequent hypotheses will assume the presence of inconsistent attribute data and no hypothesis

will be presented comparing the effects of consistent versus inconsistent data.

Predictor and Outcome Attributes. While inconsistent data may be a necessary condition, research results have shown that the presence of inconsistent data is not a sufficient condition for activation of an alternative schema. Considerable research suggests that a schema, once activated, continues to persist even though the individual is presented with contrary evidence (Anderson, Lepper, & Ross, 1980; Hamilton, 1979; Ross, Lepper, & Hubbard, 1975; El Sway & Pauchant, 1988). In addition, individuals may reinterpret subsequent contradictory data to make them supportive and consistent with their activated schema (Lord, Ross, & Lepper, 1979). Other research, however, indicates that under certain conditions inconsistent data may cause individuals to change their schema (Crocker et al., 1984). Thus, it seems that inconsistent data are necessary, but all inconsistent data are not of equal value, importance, or influence.

In order for inconsistent data to have any influence on the reframing of a strategic decision, the inconsistent data must be noticed and processed (Crocker et al., 1984). Assuming an underlying motive of cognitive efficiency (Mischel, 1981; Taylor, 1975), it seems reasonable to argue that decision makers would be less likely to search for, attend to, or process data that they considered essentially redundant. If this is the case, then one important difference may be the extent to which the inconsistent data are associated with outcome variable slots as opposed to predictor variable slots. If decision frames are networks containing predictor and outcome variable slots, then once decision

makers have framed a particular situation, they are less likely to search for, attend to, or process other forthcoming predictor data, even though that data may be inconsistent with their evoked decision frame. In contrast to supplemental predictor data, decision makers are likely to search for and anticipate outcome data associated with their evoked decision frame (Erber & Fiske, 1983; Lau & Russell, 1980; Hastie, 1984). Consequently, they are likely to attend to and process delayed inconsistent outcome data.

Within this study, predictor variables will be defined as those variables within a decision frame which are related to and temporally precede outcome variables. Predictor variable is used rather than independent variable, since the distinguishing feature is predictive validity and the temporal order of variables instead of their direct causal relationships to the outcome (Kerlinger, 1973). Outcome variables, in contrast, are analogous to criterion variables (Kerlinger, 1973) in that they represent important consequences that are related to and temporally follow predictor variables; but, unlike dependent variables, they are not necessarily causally linked to the predictor variables.

The differentiation of variable slots into predictor and outcome types parallels distinctions suggested by other researchers. Newell and Simon (1972), for example, described a variety of problem-solving tasks using "if...then" production statements. These production statements were composed of "condition-action pairs, with a description of the state of affairs on the left and a description of some action on the right" (Mayer, 1983, p. 180). In another example, Guzzo, Wagner,

Maguire, Herr, and Hawley (1986) concluded that schemata representing groups may consist of both process and outcome variables slots, and presentation of data concerning one (e.g., group process) would be accompanied by consistent memory intrusions associated with the other (e.g., group performance). Finally, social psychologists have implied similar distinctions when they have demonstrated relationships between trait or impression information, and behavioral ratings or expectations (Crocker, Hannah, & Weber, 1983; Foti, Fraser, & Lord, 1982; Hastie & Kumar, 1981; Lord, Foti, & DeVader, 1984).

While the above argument suggests that inconsistent outcome data will lead the decision maker to reframe a situation, the same effect may not occur if the initial data are distinctive. Initially equivocal data may facilitate reframing, since the original data, if they are equivocal as defined here, can be classified into more than one category. That is, the original attribute data can readily fit more than one decision frame. On the other hand, initially distinctive data may require first-order cognitive change. Distinctive attribute data, as defined here, implies that the original data can only fit one of the alternative decision frames. Thus, even if the decision maker attends to and processes the supplemental inconsistent outcome data, until those inconsistent outcome data sufficiently counterbalance the original data the decision maker is likely to continue to evoke the initial frame of reference.

In order to begin to test this argument the following hypothesis concerning the interaction between the equivocality of the original data and the presence of supplemental inconsistent outcome data is proposed.

H2: The extent to which a decision maker will evoke an opposing decision frame when given supplemental inconsistent data will be a function of the interaction between the distinctiveness of the initial attribute data and the type of inconsistent data presented (i.e., predictor versus outcome).

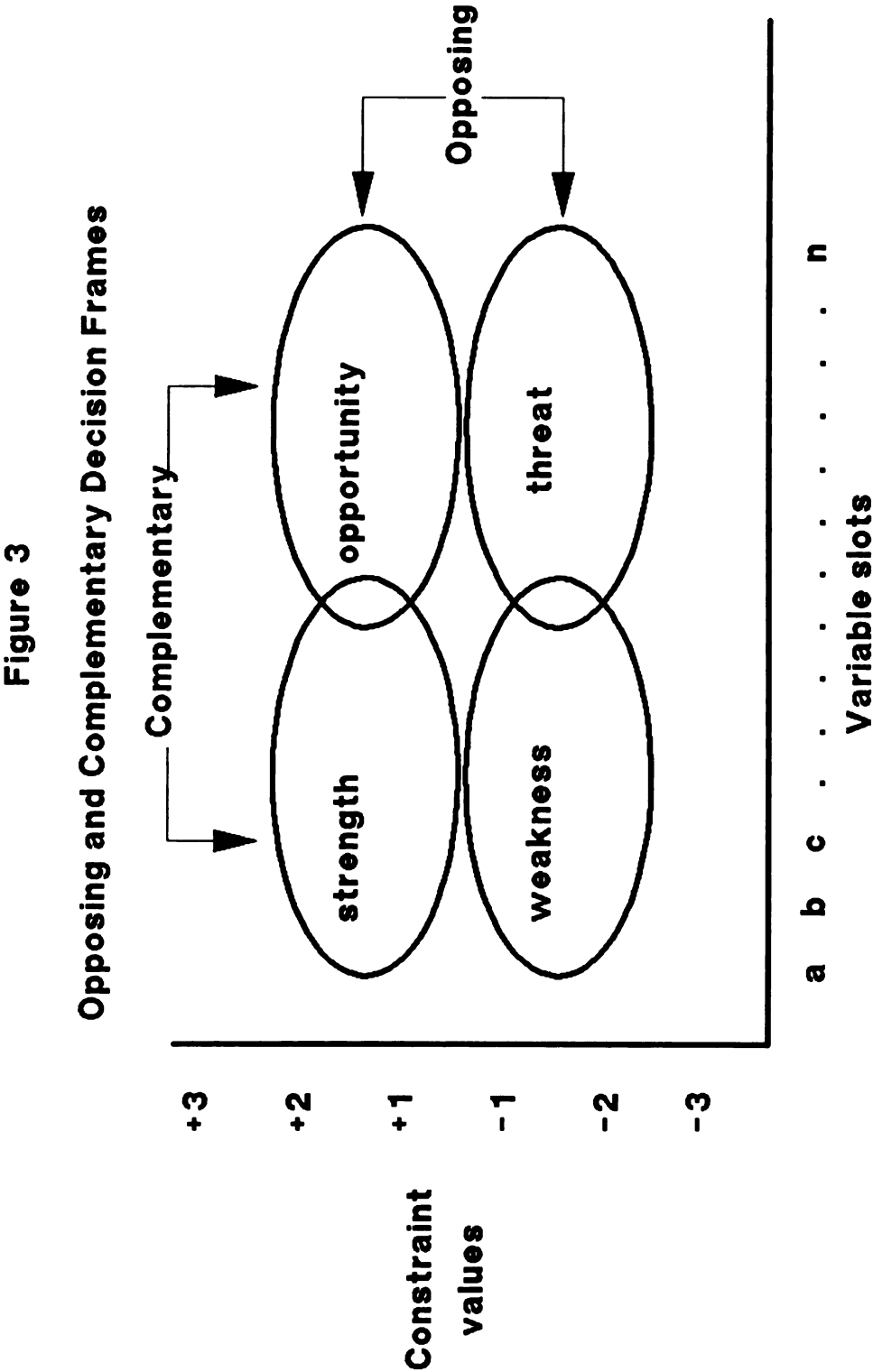
H2a: If the initial attribute data are equivocal and supplemental inconsistent predictor data are presented, the decision maker will continue to evoke the initial decision frame.

H2b: If the initial attribute data are equivocal and inconsistent outcome data are presented, the decision maker will evoke the opposing decision frame.

H2c: If the initial attribute data are distinctive and supplemental inconsistent predictor or outcome data are presented, the decision maker will continue to evoke the initial decision frame.

Within this study opposing decision frames will be defined as variable networks that are essentially identical in variable slots and, therefore, are distinguishable primarily in terms of non-overlapping constraint values. For example, variable networks for threat and opportunity decision frames may be essentially identical, while the constraint values for the shared variables may show very little overlap. In effect, opposing decision frames represent constructs on opposite ends of a single continuum. In contrast to opposing decision frames, other decision frames may share only a few variable slots with overlapping values. For example, strength and opportunity decision frames may share some but not all variables and overlapping values. Decision frames related in this fashion will be referred to here as

complementary decision frames. Using the above example, Figure 3 graphically portrays the suggested relationship between opposing and complementary decision frames.



As suggested earlier, the activation of the opposing decision frame, as hypothesized above, does not by itself demonstrate a second-order change. Since the original data are unlikely to fall within the constraint values of the opposing decision frame, a complementary decision frame may also be activated. Activation of a complementary decision frame allows the individual to reconcile the inconsistent data without a change in the original conditions. At least in this way, the original data may be reinterpreted even though they have not changed. Thus, decision makers presented with supplemental inconsistent outcome data should also activate a complementary decision frame that is congruent with the original data. However, activation of this complementary frame should only occur if the initial data were equivocal. Therefore, the following hypothesis concerning the activation of a complementary decision frame is proposed.

H3: The extent to which a decision maker will evoke a complementary decision frame when given supplemental inconsistent data will be a function of the interaction between the distinctiveness of the initial attribute data and the type of inconsistent data presented (i.e., predictor versus outcome).

H3a: If the initial attribute data are equivocal and supplemental inconsistent predictor data are presented, the decision maker will not evoke the complementary decision frame.

H3b: If the initial attribute data are equivocal and inconsistent outcome data are presented, the decision maker will evoke the complementary decision frame.

H3c: If the initial attribute data are distinctive and supplemental inconsistent predictor or outcome data are presented, the decision maker will not evoke the complementary decision frame.

Outcome Stability. As hypothesized above, the presence of inconsistent outcome data following initially distinctive data will not by itself lead to the activation of an opposing decision frame. However, if the decision makers have attended to and processed the supplemental inconsistent outcome data, as argued above, they are also likely to employ controlled attributional processes to explain the observed inconsistencies (Hastie, 1984; Kelly, 1967, 1973; Lau & Russell, 1980; Pyszczynski & Greenberg, 1981; Wong & Weiner, 1981).

Researchers have demonstrated the role attributional processes play in explaining data inconsistencies in a number of areas. Crocker et al. (1983), for example, found that subjects' impressions of another individual only changed when the inconsistent data were attributed to dispositional causes (i.e., the cause was attributed to the individual). In addition, subjects generally associated inconsistent outcomes with situational and unstable causes (Pyszczynski & Greenberg, 1981), while consistent outcomes were attributed to dispositional causes. Hastie and Kumar (1979) found similar effects but for the recall of inconsistent data.

The same effects have been reported in studies examining escalation of commitment (Staw, 1976). Staw and Ross (1978), for example, found that subjects committed the most resources to projects whose failure was attributed to "exogenous" causes (e.g., unforeseeable and not persistent) while subjects given an "endogenous" explanation (e.g., foreseeable and persistent) allocated the fewest resources to failing projects. In a study examining the limits of escalation behavior, McCain (1986) found that escalation of commitment disappeared after one

allocation cycle. Consequently, he suggested that a two-stage attributional model might best explain escalation behavior. In particular, he argued that escalation occurs initially because the individual is uncertain about the cause of the failure, while in later stages, after multiple observations, causal explanations can be formulated and the uncertainty reduced. Thus, initial escalation will lead to de-escalation, if the project continues to fail.

While a number of attribution dimensions have been proposed by various researchers (e.g., Anderson, 1983; Weiner, 1979), the above studies suggest that the apparent stability of the inconsistent outcome data would have an important influence on decision makers' causal attributions and the evocation of the opposing decision frame. If the outcomes are stable, presumably decision makers will attribute those outcomes to stable causes and change their decision frame. In contrast, unstable outcomes presumably will be attributed to unstable causes -- "temporary environmental disturbances" (Nystrom & Starbuck, 1984, p. 55) -- requiring no changes in the decision frame. Furthermore, assuming the initial data were distinctive, supplemental outcome data which are stable are more likely to counterbalance the original "facts" than are supplemental outcome data which are unstable. Outcome stability will be conceptually defined here as the variance in outcome attribute values over multiple observations with lower variances being indicative of stable outcome attribute values.

Based on the above argument the following hypothesis concerning first-order cognitive change is suggested.

- H4: For decisions initially framed in response to distinctive data, the decision maker will evoke the opposing decision frame when given supplemental stable outcome data. If the supplemental data are indicative of unstable outcomes, the decision maker will continue to evoke the initial decision frame.

Evoked Decision Frame

The effects of decision framing on managers' strategic actions will be demonstrated using opportunity/threat and strength/weakness decision frames. These four decision frames can best be described as two complementary pairs of opposing decision frames with the opportunity/threat and strength/weakness pairs being complementary frame pairs and the frames within each pair being opposing frames.

Conceptually, these four decision frames will be distinguished along two dimensions. The first dimension is associated with whether the situation is framed positively or negatively and, consequently, whether probable outcomes are perceived as gains or losses. Thus, opportunity or strength decision frames are positive frames with probable outcomes portrayed as gains, while threat or weakness decision frames are negative frames with probable outcomes portrayed as losses. The second dimension reflects whether these positive and negative frames are associated with internal or external sources. Thus, strength and weakness frames represent organizational sources of these positive or negative frames while opportunity and threat frames represent environmental sources. Therefore, in this study, an opportunity frame will be defined as a positively framed environmental condition in which

a gain is probable, while a threat will be defined as a negatively framed environmental condition in which a loss is probable. A strength will be defined as a positively framed organizational condition which will result in a probable gain, while a weakness will be defined as a negative organizational condition which will probably result in a loss.

The conceptual definitions of opportunity and threat decision frames used here are similar to those suggested by Dutton and Jackson (1987), but differ in that Dutton and Jackson included a third distinguishing attribute -- control. Threats were characterized by "relatively little control", while opportunities were characterized by a "fair amount of control" (Dutton & Jackson, 1987, p. 80). However, their model did not include strength and weakness decision frames. Consequently, they did not distinguish between organizational and environmental sources of those positive or negative frames and probable gains or losses. Their distinction concerning the degree of control may actually be more indicative of the internal/external dimension used in this study. That is, decision makers are more likely to believe they have control over their organizations' strengths and weaknesses than over environmental opportunities and threats.

While a variety of possible decision frames may affect managers' strategic choices, these four decision frames were adopted for two reasons. First, a number of texts and normative models suggest that managers should consider not only environmental conditions but also internal organizational capabilities when formulating their organizations' strategies (e.g., Ansoff, 1984; Lenz, 1980; Ohmae, 1982; Porter, 1985; Thompson & Strickland, 1987). In addition, a number of

studies suggest that both organizational and environmental factors influence strategy formulation (e.g., Anderson & Paine, 1975; Ireland, Hitt, Bettis, & de Porras, 1987; Jemison, 1981; Lyles, 1981), problem identification (Cowan, 1988; Walsh, 1988), and organizational outcomes (Pearce, 1983). Second, researchers have explored the effects of "threat" and "opportunity" decision frames on strategic choices (Fredrickson, 1985; Dutton & Jackson, 1987; Jackson & Dutton, 1988), but have not considered other decision frames which may be equally critical. The frame of reference decision makers adopt during the decision making process is not limited to environmental conditions, but represents the overall perspective they take while arriving at the decision. If decision framing does affect strategic choices, then equal consideration should be given to managers' interpretations of organizational as well as environmental factors that color those choices.

Consequences on Corporate-level Strategy

While organizational strategy can be formulated at multiple levels, this study will consider strategic actions at the corporate level. Corporate-level strategy addresses the question of what businesses the organization should enter as opposed to the way the organization plans to compete within the chosen business (Beard & Dess, 1981). Models of corporate-level strategy usually incorporate, in one form or another, an assessment of industry attractiveness and relative corporate strength (Christensen, Berg, & Salter, 1980; Henderson & Zakon, 1979; Pearce, 1982; Thompson & Strickland, 1987). Thus, there appears to be a beneficial overlap between the criteria recommended in selecting

alternative corporate-level strategies and the decision frames examined in this study.

This study will consider eleven alternative corporate-level strategies: concentration, market development, product development, backward integration, forward integration, horizontal integration, concentric diversification, conglomerate diversification, retrenchment, divestiture, and liquidation (Aldag & Stearns, 1987; Kotler, 1984; Pearce, 1982; Pearce & Robinson, 1985; Smith, Arnold, & Bizzell, 1985; Thompson & Strickland, 1987). Since this study is descriptive in nature, no specific hypotheses will be presented concerning which specific strategies will be chosen when each alternative decision frame is evoked. However, the results of the study should provide some insight concerning the extent to which managers follow experts' prescriptions (Aldag & Stearns, 1987; Pearce, 1982; Pearce & Robinson, 1985; Christensen et al., 1980). Based on this discussion the following hypothesis is presented.

- H5: The decision frame the decision maker evokes in a given situation will be related to the decision maker's corporate-level strategy recommendations.

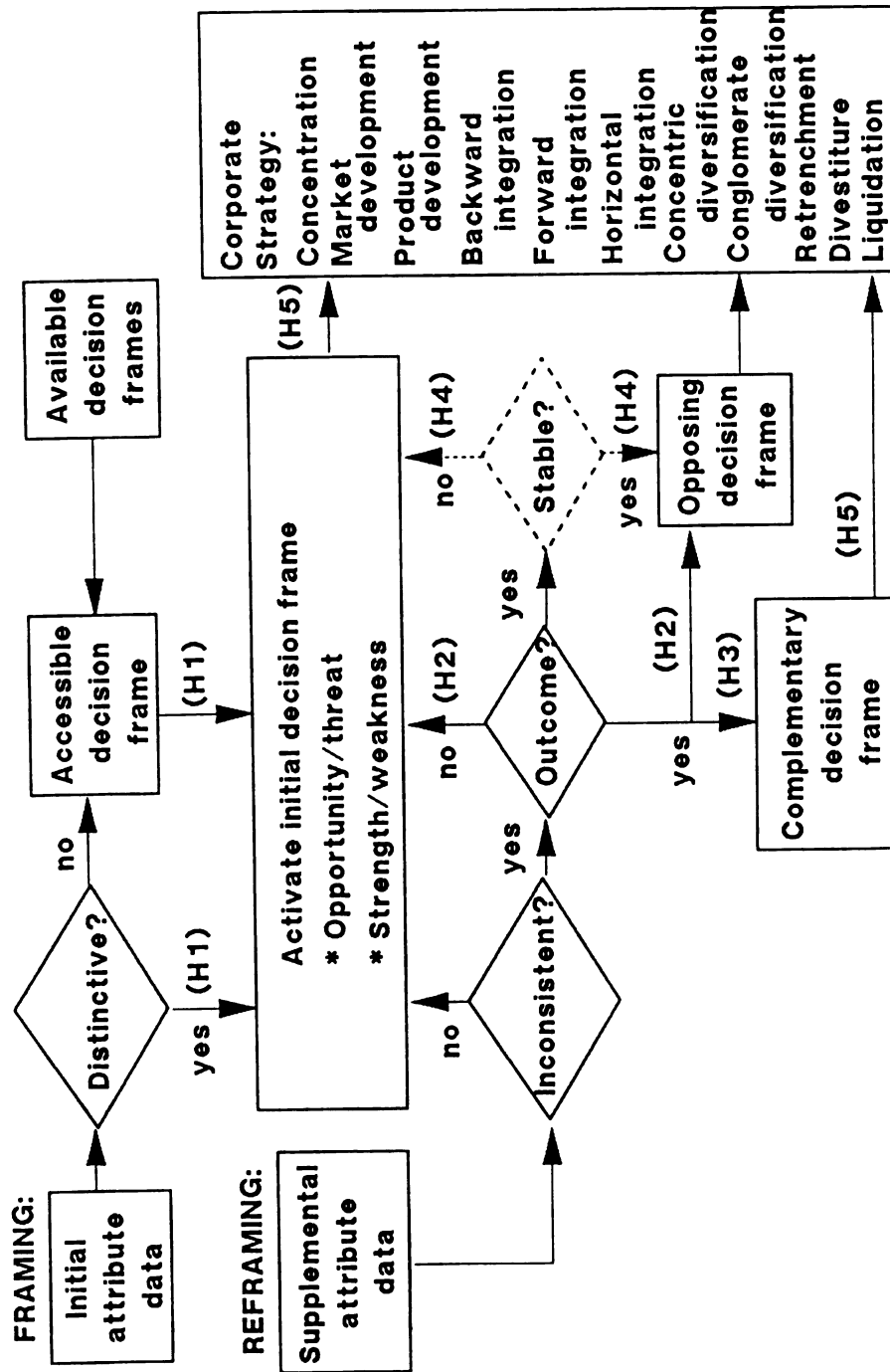
Finally, in order to test whether the evoked decision frames are cognitive structures which mediate between the stimulus attribute data and the decision maker's corporate level strategy recommendations, the following hypothesis is proposed.

- H6: The relationship between the attribute data presented and the decision maker's corporate-level strategy recommendations will be non-significant when controlling for the decision maker's evoked decision frame.

Summary

In summary, this study will attempt to identify those factors that lead decision makers to evoke alternative decision frames in a given situation and the consequences of those decision frames on corporate level strategic choices. The proposed model and hypotheses examine not only the initial framing of a strategic decision but also the subsequent reframing of previous decisions. As summarized in Figure 4, the distinctiveness of the available stimulus data and the accessibility of the alternative decision frames interact to determine which decision frame will be initially evoked. The subsequent reframing of the initial decision depends on the equivocality of the original data and the presence of supplemental inconsistent outcome data. First-order change processes, in comparison, only occur if the supplemental inconsistent outcome data are stable over multiple observations. Reframing is further distinguished from first-order change by activation of both complementary and opposing decision frames. Once the alternative decision frames are evoked they are hypothesized to influence the decision maker's corporate-level strategy recommendations.

Figure 4
Flowchart of Strategic Decision Framing
Model and Hypotheses



Chapter 4

Method

The study used an experimental design involving a three-part scenario which was administered to a sample of 180 top and middle-level managers in auto-supplier firms. Each part of the scenario presented manipulated attribute data for one of the four alternative decision frames. Part 1 of the scenario used a 2 X 3 factorial design crossing the value of the data (i.e., positive or negative) with the distinctiveness of the data (distinctive opportunity/threat, equivocal, or distinctive strength/weakness). These manipulations along with a measure of decision-frame accessibility (internal vs. external) were used to test the initial framing hypothesis (H1). Part 2 of the scenario introduced a third factor by presenting different types of inconsistent data (i.e., predictor vs. outcome). This manipulation was used to test the reframing hypotheses (H2 and H3). Finally, the stability of the inconsistent data, a fourth factor, was manipulated in Part 3 of the scenario to test the first-order change hypothesis (H4). After each part of the scenario, the manager's frame of reference was measured with two multi-item scales. Finally, the managers were asked at the end of the scenario the extent to which they would recommend eleven different corporate-level strategies (H5 and H6).

Experimental Stimuli and Independent Measures

Development of Experimental Stimuli. In order to develop the experimental stimuli to test each hypothesis, it was first necessary to identify predictor and outcome attributes that decision makers consider

distinctive of each decision frame -- those that distinguish one decision frame from its counterpart, and those that were common to complementary decision frames. Once identified, these attributes could then be manipulated within the scenario.

An initial set of attributes was identified through an extensive review of the literature concerning the assessment of organizational strengths and weaknesses (Byars, 1987; David, 1986; Higgins & Vincze, 1986; Hussey, 1968; Ireland et al., 1987; King, 1983; Smith et al., 1985; Stevenson, 1976; Thompson & Strickland, 1987; Weihrich, 1982) and the identification of environmental opportunities and threats (Ansoff, 1975; David, 1986; Porter, 1980; Thompson & Strickland, 1987; Weihrich, 1982). Many of these sources provided questions or lists of factors that were associated with one or more of these decision frames (e.g., Byars, 1987; David, 1986; Higgins & Vincze, 1986; Ireland et al., 1987; Porter 1980; Thompson & Strickland, 1987). These lists were combined and consolidated to form a single list of 40 predictor attributes. In addition, the above literature was used to identify 16 prototypical indicators of industry and organizational outcomes (e.g., sales, growth rate, cost/unit, market share, profit margins, return-on-assets).

Using these attributes, two questionnaires were developed and administered to a sample of 52 top and middle-level managers in sixteen auto-supplier firms in Michigan. While both questionnaires presented identical lists of attributes, one had instructions and scale anchors with an internal frame of reference (to generate attributes distinctive of strength and weakness decision frames), and the other had instructions and scale anchors with an external frame of reference (to

generate attributes distinctive of opportunity and threat decision frames).

Using a five-point Likert scale, the managers were asked to rate the extent to which the 40 predictor attributes fit their image of an "internally caused problem" or "externally caused problem", depending on which version of the questionnaire they received. External problems were described in the instructions as "problems associated with threats in the organization's environment" while internal problems were described as "problems associated with weaknesses within the organization itself". Scale anchors for internal-predictor attribute ratings were "5 - very much fits my image of an internal problem" , "3 - somewhat fits my image of an internal problem", and "1 - does not fit my image of an internal problem". Analogous wording was used with those managers who completed the external-predictor attribute ratings. All predictor attributes were presented from a negative frame of reference and suggested probable losses (e.g., "The costs of the firm's raw materials are rising").

The decision to use attributes from a single perspective, in this case a negative frame of reference, was based on two considerations. First, a field test using both positive and negative attributes was ineffective in generating attributes that captured the internal and external dimensions which distinguished opportunities from strengths and threats from weaknesses. When both positively and negatively framed attributes were presented to an initial sample of managers their responses focused on the "positive-negative" dimension that distinguished the decision frames and ignored the "internal-external"

dimension. Second, theoretically the attributes represented the variable slots that constituted the decision frames and, as variable slots, it was assumed that they could take on either positive or negative values. Thus, presenting attributes from a single value perspective was consistent with the basic cognitive framework used to characterize decision frames.

In terms of the 16 outcome attributes, the managers were asked to indicate on a five-point Likert scale the likelihood of each outcome occurring if an "external" or "internal" problem existed (again, depending on which questionnaire they received). Scale anchors for the outcome attribute ratings were identical for both instruments (e.g., "5 - very likely the outcome will occur", "3 - somewhat likely the outcome will occur", and "1 - very unlikely the outcome will occur"). The instructions, however, differed in terms of their "internal" or "external" frame of reference (e.g., "likelihood that the outcome will occur when the firm's environment presents external threats"). The outcome attributes were also phrased negatively (e.g., "Industry profit margins will narrow"). Appendices A and B include samples of both instruments.

Of the 52 top and middle-level managers who completed the self-administered questionnaires, 29 provided ratings from an internal frame of reference and 23 provided ratings from an external frame of reference. Since the questionnaire responses were collected on site, the response rate was 100%. The demographic characteristics of these managers are shown in Appendix C. Table 1 shows the standardized ratings for the 40 predictor attributes for both groups of managers.

These ratings were used to develop the experimental stimuli as described below.

Table 1

Predictor Attribute Ratings

Attribute	Internal Reference			External Reference			t-test
	Raw mean	Raw SD	Standardized mean ¹	Raw mean	Raw SD	Standardized mean ¹	
pred 1	2.72	1.36	-.075	2.43	1.47	.079	-0.553
pred 2	3.07	1.36	.198	2.26	1.45	-.065	0.943
pred 3	1.66	0.90	-.905	3.13	1.46	.670	5.643***
pred 4	3.21	1.50	.308	1.83	1.03	-.428	2.637**
pred 5	2.72	1.31	-.075	2.13	1.14	-.175	0.355
pred 6	3.45	1.35	.496	1.91	1.28	-.361	3.067**
pred 7	2.83	1.31	.011	2.35	1.23	.011	-0.002
pred 8	2.79	1.32	-.021	2.52	1.44	.155	-0.629
pred 9	2.83	1.31	.011	1.26	0.45	-.910	3.297**
pred 10	2.69	1.26	-.099	2.70	1.33	.307	-1.454
pred 11	2.66	1.17	-.122	2.43	1.12	.079	-0.721
pred 12	3.72	1.25	.707	4.35	0.83	1.701	-3.561***
pred 13	3.00	1.19	.144	1.68	0.95	-.555	2.452*
pred 14	3.41	1.35	.465	3.48	1.59	.966	-1.797
pred 15	3.17	1.17	.277	2.61	1.27	.231	0.164
pred 16	3.41	1.21	.465	2.91	1.31	.485	-0.071
pred 17	2.28	1.41	-.420	1.59	1.05	-.631	0.756
pred 18	2.79	1.32	-.021	1.65	0.93	-.580	2.004*
pred 19	3.38	1.24	.441	3.52	1.24	1.000	-2.002*
pred 20	2.31	1.23	-.396	2.61	1.34	.231	-2.247*
pred 21	2.97	1.48	.120	1.57	0.84	-.648	2.751**
pred 22	2.31	1.49	-.396	1.86	1.17	-.403	0.023
pred 23	2.50	1.45	-.248	1.45	0.74	-.749	1.761
pred 24	3.00	1.60	.144	1.91	1.28	-.361	1.806
pred 25	2.31	1.28	-.396	3.04	1.33	.594	-3.548***
pred 26	2.64	1.21	-.130	2.55	1.37	.190	-1.147
pred 27	2.76	0.99	-.044	2.73	1.32	.332	-1.332
pred 28	3.14	1.51	.253	1.73	0.88	-.513	2.709**
pred 29	3.11	1.31	.230	2.23	1.45	-.090	1.123
pred 30	2.96	1.00	.112	2.67	1.06	.282	-0.587
pred 31	3.03	1.48	.167	1.73	1.08	-.513	2.405*
pred 32	3.44	1.09	.488	3.00	1.31	.561	-0.252
pred 33	2.79	1.42	-.021	1.68	0.78	-.555	1.875
pred 34	2.59	1.21	-.177	3.05	1.50	.603	-2.759**
pred 35	2.14	1.13	-.529	2.45	1.47	.096	-2.211*
pred 36	2.24	1.12	-.451	2.41	1.40	.062	-1.815
pred 37	2.90	1.26	.065	1.86	0.99	-.403	1.656
pred 38	1.62	0.94	-.936	2.59	1.62	.214	-4.069***
pred 39	2.83	1.20	.011	2.27	1.16	-.056	0.237
pred 40	3.10	1.35	.222	1.55	0.86	-.665	3.136**

*** p< .001, ** p< .01, * p< .05

¹ Standardized mean based on grand mean and variance across all items.

Distinctive and Equivocal Stimuli. Stimulus distinctiveness was operationalized as the presentation, in Part 1 of the scenario, of four predictor attribute statements considered indicative of one, and only one, of the four decision frames examined in this study. For example, in Part 1 of the distinctive threat scenario four attribute statements were presented that were indicative of a threat but not indicative of opportunities, strengths, or weaknesses based on the analysis described above.

Distinctive predictor attributes were identified by comparing the standardized mean attribute ratings for the two groups of managers (e.g., internal vs. external). Standardized means were used rather than raw scores to control for possible scaling differences between the two versions of the instrument (Ghiselli, Campbell, & Zedeck, 1981). The managers' raw mean attribute ratings were standardized using as a base the grand mean and standard deviation for all items for both groups of managers.

Using these standardized ratings, attributes with significantly different means were considered distinctive of the frame of reference with the highest positive mean. Referring to Table 1, predictor attribute 3 ("International markets are being closed for possible export of the firm's product") showed significantly different mean ratings between the two samples ($t=5.64$, $p<.001$) with a standardized mean of .67 for those managers completing the external rating and a standardized mean of -.91 for those completing the internal rating. This attribute was considered distinctive of an external frame of reference.

In contrast to a distinctive stimulus, an equivocal stimulus was operationalized as the presentation of four predictor attribute statements that were indicative of complementary decision frames -- decision frames sharing common variables with overlapping values. Thus, for the complementary opportunity-strength decision frames, Part 1 of the scenario presented four attribute statements that were considered indicative of both opportunity and strength decision frames and not indicative of threat and weakness.

Using the managers' attribute ratings, equivocal attributes were defined as those attributes with positive means which were not significantly different. For example, the difference in ratings for predictor attribute 16 ("Suppliers to the firm are becoming less reliable in their delivery of raw materials") was non-significant and the respective standardized means were .47 (internal) and .49 (external).

While the above procedure was used to initially identify distinctive and equivocal predictor attributes, the design of the study necessitated some refinement of these general procedures. First, more distinctive predictor attributes were identified than were required in the study. Consequently, of the significantly different predictor attributes, those seven with the greatest mean differences and the most positive standardized means for their respective frames of reference were selected for inclusion in the scenario. Four of these seven were used in Part 1 of the scenario to manipulate distinctiveness while the remaining three were used for the manipulation in Part 2 of the scenario. Of the equivocal predictor attributes that were identified,

the four with the highest standardized means and the lowest mean differences were selected.

Although other criteria might have been used for selecting the distinctive and equivocal attributes used in the scenario, the results of the study, as will be described later, indicated that the manipulations of distinctive and equivocal stimuli were effective. The distinctive and equivocal predictor attributes that were used in Part 1 of the scenario are shown in Figure 5.

Figure 5

Scenario Attributes: Part 1

Strength/weakness predictor attributes:

1. "The firm is not attracting and retaining highly competent employees." (Pred 6)
2. "Buyer satisfaction with the firm's product is decreasing." (Pred 9)
3. "The firm is not successfully adapting to recent changes in production technology." (Pred 21)
4. "The management of the firm is becoming less effective in responding to operational needs." (Pred 28)

Opportunity/threat predictor attributes:

1. "International markets are being closed for possible export of the firm's product." (Pred 3)
2. "The costs of the firm's raw materials are increasing." (Pred 12)
3. "The firm is losing its access to raw material suppliers." (Pred 20)
4. "Shifts in the population are decreasing demand for the firm's product." (Pred 38)

Equivocal predictor attributes:

1. "Competitors are successfully introducing more efficient production technologies." (Pred 15)
 2. "Suppliers to the firm are becoming less reliable in their delivery of raw materials." (Pred 16)
 3. "The relative quality and performance of substitute products is improving." (Pred 30)
 4. "Buyers are less willing to pay a premium price for the firm's product." (Pred 32)
-

Finally, since the decision frames in an opposing pair (i.e., opportunity/threat and strength/weakness) were assumed to be essentially identical in variable slots, the same four attributes were used for both frames in an opposing pair; however, the values were manipulated to evoke one or the other frame in the pair. Thus, the "costs of the firm's raw materials" were described as either "decreasing" or "increasing" to evoke opportunity or threat decision frames respectively.

These operational definitions and manipulations are consistent with the earlier conceptual framework suggesting that alternative decision frames can be represented as overlapping variable networks. Distinctive attributes which distinguish one frame from another were represented by non-overlapping variables or constraint values, while equivocal attributes were represented by overlapping variables and constraint values between two decision frames.

Inconsistent Stimuli. Inconsistent stimuli were operationalized as the presentation, in Part 2 of the scenario, of three attribute statements distinctive of the managers' opposing decision frame. As described earlier, opportunity and threat were opposing decision frames in this study as were strength and weakness. Thus, if a manager evoked a threat frame in response to Part 1, the presentation of attributes statements distinctive of an opportunity in Part 2 would be considered inconsistent, since it was opposite the manager's evoked frame of reference.

The inconsistency of the data in Part 2 was determined by comparing the managers' evoked decision frame in Part 1 with the decision frame presented in Part 2. The data presented in Part 2 were considered

inconsistent if the managers had evoked the opposite decision frame in response to Part 1. The data in Part 2 were not considered inconsistent if the managers had evoked any other frame except the opposing frame in response to Part 1.

Since the reframing hypotheses assumed that inconsistent data were necessary, inconsistency was not systematically manipulated. The intent was that most of the managers would receive inconsistent data in Part 2. In part, this was accomplished in scenarios which presented distinctive data by presenting attributes in Part 2 for the frame opposite the frame presented in Part 1. In the case of equivocal data, however, there was no way to know in advance which decision frame the managers would evoke in response to Part 1 since that depended, according to H1, on their chronically accessible frame of reference. Thus, the decision frame attributes presented in Part 2 for these managers could not be consistently matched with their evoked decision frame.

A manipulation check was also included at the end of Part 2 to determine whether the managers considered the data inconsistent. Specifically, the managers were asked to indicate on a nine-point bipolar Likert scale the extent to which the data in Parts 1 and 2 were consistent (+4) or inconsistent (-4).

Predictors and Outcome Attributes. While the inconsistency of the data was not experimentally manipulated in Part 2, the extent to which the data represented predictor or outcome attributes was manipulated. Approximately one-half of the managers responded to scenarios which presented three distinctive outcome attributes in Part 2 while the other

one-half responded to scenarios which presented three distinctive predictor attributes in Part 2.

The procedures used to identify the distinctive outcome attributes used in Part 2 were identical to those used earlier to identify the distinctive predictor attributes. That is, outcome attributes with significantly different standardized means were considered to be distinctive of the frame of reference with the highest positive standardized mean. Table 2 presents the outcome attribute ratings.

Table 2

Outcome Attribute Ratings

Attribute	Internal Reference			External Reference			t-test
	Raw mean	Raw SD	Standardized mean ¹	Raw mean	Raw SD	Standardized mean ¹	
out 1	3.31	1.37	.135	2.88	1.15	.015	0.430
out 2	3.34	1.04	.159	2.65	1.07	-.155	1.117
out 3	2.31	1.42	-.643	3.30	1.26	.455	-3.932***
out 4	3.45	1.27	.244	2.68	0.89	-.125	1.306
out 5	3.32	1.09	.143	2.35	0.88	-.434	2.050*
out 6	2.38	1.12	-.389	2.13	1.18	-.640	0.184
out 7	3.45	1.40	.244	2.26	1.05	-.518	2.730**
out 8	2.79	1.45	-.269	3.65	1.07	.782	-3.767***
out 9	3.38	1.40	.190	2.57	0.95	-.228	1.496
out 10	3.38	1.40	.190	2.00	1.04	-.761	3.406**
out 11	2.52	1.40	-.480	3.17	1.03	.333	-2.911**
out 12	3.79	1.21	.509	3.61	1.08	.745	-0.846
out 13	3.93	1.28	.618	4.39	0.84	1.475	-3.070**
out 14	3.21	1.35	.057	2.65	1.19	-.530	0.754
out 15	2.59	1.18	-.425	2.48	1.27	-.312	-0.404
out 16	3.03	1.18	-.083	2.30	1.15	-.481	1.425

*** p< .001, ** p< .01, * p< .05

¹ Standardized mean based on grand mean and variance across all items.

While the above procedures were successful in generating the six distinctive predictor attributes for Part 2, these same procedures were unsuccessful in generating an equivalent number of distinctive outcome attributes. The lack of distinctive outcomes was due primarily to the limited number of outcome attributes that could be identified in the literature, especially external environmental outcomes, and the need to use the four most distinctive outcomes in construction of the scales to measure the dependent variable. In addition, since the design of the study required a balance in the number of attributes presented in each scenario part, it did not seem reasonable to reduce the number of attributes presented in Part 2 manipulations.

Consequently, the criteria used in selecting distinctive outcome attributes were relaxed. Specifically, of the six outcome attributes used in the scenario, three had significantly different means, while the other three did not attain a .05 significance level. The remaining three outcomes were significantly different at the .10 level (one-tailed test). While not ideal, the use of outcome attributes which did not meet the more stringent criteria was not considered fatal. First, the scenario would present three outcome attributes simultaneously with at least one of the three attributes coming from the group that met the original selection criteria. In the case of opportunity/threat decision frames two of the three outcome attributes met the original criteria while in the case of strength/weakness outcomes only one outcome attribute met the original criteria. Second, it was assumed that there would be an additive affect among the outcome attributes which would reinforce their distinctiveness. Finally, given the small sample size

(n=52) and the low level of power in this analysis, a less stringent significance level may have been more appropriate than the commonly accepted standard. In any case, these modified procedures, using less stringent significance tests, do represent a limitation of this study, which will be examined in Chapter 5, "Results".

Based on the above procedures, the predictor and outcome attributes used in Part 2 of the scenario are shown in Figure 6.

Figure 6

Scenario Attributes: Parts 2 and 3

Strength/weakness predictor attributes:

1. "The firm's plant and equipment are becoming increasingly obsolete." (Pred 4)
2. "Employees in the firm's R&D department are having problems in developing successful product innovations." (Pred 13)
3. "The firm is becoming less effective at monitoring and controlling production costs." (Pred 40)

Opportunity/threat predictor attributes:

1. "Competitors are becoming less aggressive in their pricing practices." (Pred 19)
2. "The firm is relying on fewer suppliers for its raw materials." (Pred 25)
3. "A number of new firms are entering the market." (Pred 34)

Strength/weakness outcome attributes:

1. "The firm's sales are deteriorating." (Out 4)
2. "The firm's inventory levels are rising." (Out 5)
3. "The firm's market share is decreasing." (Out 9)

Opportunity/threat outcome attributes:

1. "The industry growth rate is declining." (Out 11)
 2. "The firm's profit margins are narrowing." (Out 12)
 3. "Less efficient firms are leaving the industry." (Out 13)
-

Outcome Stability. Outcome stability was operationalized here as variation in outcome attribute data over two observations. Specifically, the stable outcome condition used the same attributes to describe outcomes in Part 2 and Part 3 of the scenario, while the unstable outcome condition used opposing outcome attributes in Parts 2 and 3. Thus, a scenario with stable outcomes for an opportunity decision frame provided outcome attributes distinctive of an opportunity in both Parts 2 and 3, while a scenario with unstable outcomes for an opportunity alternated between outcomes distinctive of an opportunity and those distinctive of a threat.

A stability manipulation check was included at the end of Part 3 of the scenario. Using a nine-point bipolar Likert scales the managers were asked whether the firm's situation over the last two years was stable (+4) or unstable (-4).

Decision Frame Accessibility. Within this study decision frame accessibility was operationalized as chronic accessibility and was assessed through an open-ended free-recall task. Specifically, the managers were asked to identify factors they felt would have a significant affect on their firm's performance in the next three years. Space was provided for five responses and they were asked to respond in complete sentences or statements. After listing as many factors as they could, the managers were asked to indicate whether they considered each factor to be a characteristic associated with their firm (i.e., an internal factor) or a characteristic associated with their firm's environment (i.e., an external factor). Appendix D includes a copy of

the instrument and instructions used to measure decision frame accessibility.

Using the managers' internal and external classification of the identified factors, a decision frame accessibility score was calculated for each manager. Factors the managers had categorized as external were coded as -1 and factors they had categorized as internal were coded as +1. These coded factors were proportionally weighted in descending order with the first being assigned the largest weight and the last factor the smallest weight. Since some managers listed fewer than five factors, the specific weights were based on the number of factors identified. For example, if five factors were identified, the first factor was assigned a weight of 5 and the first a weight of 1; if two factors were identified, the first was weighted 3.5 and the second 2.5. These weighted responses were then averaged. Based on these procedures, the decision frame accessibility scores would range from -3.0 to +3.0 in value with negative values indicating that an external frame of reference was more accessible and positive values indicating that an internal frame of reference was more accessible.

Dependent Measures

Evoked Decision Frame. The literature on schematic information processing suggests that when a particular decision frame is evoked the information recalled regarding the situation should be consistent with the evoked decision frame but not its counterpart (Cantor & Mischel, 1977; Zandy & Gerard, 1974). Furthermore, there should be memory intrusions consistent with the activated decision frame but not its alternative. Finally, the individual's expectations should be

consistent with the decision frame but not its alternative (Guzzo et al., 1986; Markus & Zajonc, 1985). Given these observations, the evoked decision frame was operationalized here as the degree to which managers' expectations and evaluation of the situation were consistent with a particular decision frame.

The evoked decision frame was measured using two four-item, nine-point Likert scales. There was one four-item scale for the opportunity/threat decision frame pair which was referred to here as the External Decision Frame Scale, and one four-item scale for the strength/weakness pair which was referred to as the Internal Decision Frame Scale.

Of the four items in each scale, two items were reflective of expected outcomes associated with each frame of reference (i.e., internal and external). Using the previously described outcome attribute ratings and procedures, the two most distinctive outcomes for each frame of reference, internal and external, were selected for inclusion in the scale. The most distinctive outcomes were operationalized as those outcome attributes with the greatest difference in standardized mean attribute ratings. Given the conceptual framework used here, the purpose of these outcome items was to capture the managers' memory intrusions for the outcome variable slots. Consequently, the outcome attributes used in the decision frame scales were not manipulated within the scenario.

In addition to the two outcome items in each scale, one evaluative item was included in each scale (e.g., attractiveness of the industry or

effectiveness of management). This item also was intended to capture the managers' memory intrusions.

Finally, one item directly assessed the extent to which the managers considered the scenario to reflect one of the four decision frames (i.e., environmental opportunities/threats or organizational strengths/weaknesses). This item was selected because of its apparent face validity in identifying which decision frame the managers had evoked.

The two four-item scales were presented at the end of each scenario part. The items and scales are shown Figure 7. Clark was the name of the firm in the scenario and it was in the hydraulic line industry.

Figure 7

Decision Frame Scales

Internal Decision Frame Scale (strength/weakness):

Clark's productivity will.....	improve	deteriorate
	+4 +3 +2 +1 0 -1 -2 -3 -4	

Clark's competitive position in the market will.....	improve	deteriorate
	+4 +3 +2 +1 0 -1 -2 -3 -4	

Clark's management is.....	effective	ineffective
	+4 +3 +2 +1 0 -1 -2 -3 -4	

Clark has a number of.....	strengths	weaknesses
	+4 +3 +2 +1 0 -1 -2 -3 -4	

External Decision Frame Scale (opportunity/threat):

Profit margins in the hydraulic line industry will.....	increase	decrease
	+4 +3 +2 +1 0 -1 -2 -3 -4	

Industry-wide sales will.....	increase	decrease
	+4 +3 +2 +1 0 -1 -2 -3 -4	

The hydraulic line industry is.....	attractive	unattractive
	+4 +3 +2 +1 0 -1 -2 -3 -4	

Clark's environment presents a number of.....	opportunities	threats
	+4 +3 +2 +1 0 -1 -2 -3 -4	

Since the opposing decision frames in a pair were conceptualized here as alternatives on a single continuum, the evoked decision frame score was calculated as the average rating for each four-item scale. Threat and weakness items were scored as negative values, while opportunity and strength items were scored positively. Thus, a positive value for the External Decision Frame Scale was indicative of an opportunity decision frame, while a negative value was indicative of a threat decision frame.

Corporate-level Strategy. At the end of each scenario, the managers were asked to indicate the desirability of eleven alternative corporate-level strategies. Figure 8 presents the alternative strategies and their operational definitions. The definitions were developed from current textbooks and articles which described alternative corporate strategies (e.g., Aldag & Stearns, 1987; Kotler, 1984; Pearce, 1982; Pearce & Robinson, 1985; Smith et al., 1985; Thompson & Strickland, 1987).

Using these definitions and five-point Likert scales, the managers were asked at the end of the scenario to rate the desirability of each strategy over the next three years. Scale anchors were "5 = desirable strategy" and "1 = undesirable strategy". Nominal measures of strategy using definitions similar to the ones proposed here have been successful in a number of other studies (e.g., Hitt & Ireland, 1985; Ireland et al., 1987; Miles & Snow, 1978; Pearce, Robbins, & Robinson, 1987). The instructions and scales are included at the end of Appendix E.

Figure 8

Corporate-level Strategies

Concentration:	Growth is accomplished by directing resources toward selling the current product to the current market.
Market development:	Growth is accomplished by selling the current product to new markets.
Product development:	Growth is accomplished by selling a new product to the current market.
Backward integration:	Growth is accomplished by establishing a new business in the firm's current supply channel.
Forward integration:	Growth is accomplished by establishing a new business in the firm's current distribution channel.
Horizontal integration:	Growth is accomplished by acquiring businesses that produce the same product as the firm.
Concentric diversification:	Growth is accomplished by establishing a new business similar or related to the current business in terms of products, markets, or technologies.
Conglomerate diversification:	Growth is accomplished by establishing a new business unrelated to the current business.
Retrenchment:	Retraction is accomplished by temporarily reducing operating levels in the current business.
Divestiture:	Retraction is accomplished by selling or permanently closing a portion of the current business.
Liquidation:	Retraction is accomplished by selling the current business and terminating all business activities.

Experimental Procedures

All managers participating in the study were asked to complete the decision frame accessibility measure and respond to a randomly assigned scenario. However, in order to gain sufficient sample size and power within the study, the instruments were administered to two different samples of auto suppliers, which required slightly different administration procedures.

An initial sample of subjects were executive and middle-level managers in auto-supplier firms in Michigan. Data were gathered from these managers as part of a larger study of auto-supplier strategies. In this larger study, individual on-site interviews were conducted with four or five managers at each firm and data were gathered concerning the firm's strategy, goals, performance, operations, and relationships with auto manufacturers. With regard to the study presented here, this sample of managers was asked to complete the decision frame accessibility measure prior to beginning the individual on-site interview. The accessibility measure was administered first to minimize any priming effects that might occur as a result of the questions asked in the interview. Next, the on-site interview for the larger study was conducted. Once the interview was completed, the managers were given a copy of the scenario to complete and return by mail in a postage-paid envelope.

A second sample of subjects consisted of top-level managers in auto-supplier firms throughout the United States. In this case, the accessibility measure and the scenario were included in a single survey booklet and mailed directly to the managers. Postage-paid envelopes

were enclosed so they could return the booklet by mail. To insure a similar order of presentation, the accessibility measure was presented in the survey booklet prior to the scenario. The instructions, experimental stimuli, and measures used with this sample were identical to those used with the first sample.

As described above, both samples of managers initially responded to the accessibility measure. The instructions asked them to identify factors they felt would have a significant effect on their firm's performance in the next three years. Space was provided for five responses and they were asked to provide as many responses as possible. Next, the managers indicated in a box to the left of their response whether they considered the factor to be an internal factor (i.e., associated with their firm) or an external factor (i.e., associated with their firm's environment). They were instructed to classify each factor into only one category.

The scenario to which all managers responded described a fictitious auto-supplier firm in the hydraulic-line industry -- Clark Inc. The scenario instructions stated that the scenario described a hypothetical firm and briefly described the managers' task.

Part 1 of the scenario followed the instructions. The initial paragraph in Part 1 was held constant and provided neutral data about Clark's size, sales, assets, and age. The data were considered neutral since the values reflected the averages for auto-supplier firms. The second paragraph in Part 1 of a scenario presented four distinctive or four equivocal attributes. Based on the data they had been given in Part 1 of a scenario, the managers were then asked to give their overall

impression of the situation by completing the two decision frame scales.

The items from the two scales were alternated to minimize possible rating biases. Appendix E provides a sample scenario with instructions and scales for each scenario part.

Part 2 of each scenario presented three predictor or outcome attribute statements. These attributes were embedded in the first paragraph of Part 2. If the data in Part 1 were distinctive, the attributes presented in Part 2 were always distinctive of the opposite frame. For example, if a manager received distinctive strength data in Part 1, the same manager received predictor or outcome data distinctive of a weakness in Part 2. This matching procedure was established since the reframing hypotheses (H2 to H4) all assumed that the data the managers received in Part 2 were inconsistent. As described earlier, inconsistent data were operationalized as the presentation of attributes for the managers' opposing decision frame. Thus, if H1a was correct and the managers evoked the decision frame associated with the distinctive attribute data, these matching procedures would increase the probability that the managers would receive inconsistent data in Part 2 and increase the available sample for these analyses.

However, in the case of scenarios which presented equivocal stimuli in Part 1, the attributes in Part 2 could not be systematically matched with the frame of reference presented in Part 1 since the data were equivocal. In an effort to increase the probability that these managers would also receive data inconsistent with their evoked decision frame in Part 2, the following procedures were implemented. First, in the case of the first managerial sample, the attributes in Part 2 were matched

with the managers' accessible decision frame. For example, if a manager responded to a positively framed equivocal stimuli and the responses to the accessibility measure indicated that an internal frame was more accessible, the manager was given a scenario that presented weakness attributes in Part 2. This procedure was based on the assumption that H1b was correct -- that the managers would evoke the more accessible frame when responding to equivocal stimuli. In the case of the second sample, the process was simply randomized since there was no way of determining in advance which frame was more accessible. Finally, in all cases, the attributes presented in Part 2 of these scenarios were of the opposite value to the data presented in Part 1.

At the end of Part 2, the managers were again asked to indicate their impression of Clark's situation by completing the two decision frame scales. In addition, they completed the consistency manipulation check.

Part 3 of the scenario presented three outcome attributes which were embedded in the first paragraph. Stability was manipulated by presenting attribute data which were either consistent or inconsistent with those presented in Part 2. Since stability and instability suggest variation over time, the first sentence in Part 3 stated that the data reported in Part 3 represented Clark's situation two years later. After reading Part 3, the managers were asked again to complete the decision frame scales and the stability manipulation check.

After completing Part 3 the managers were asked to rate the desirability of the eleven alternative corporate level strategies based on their overall impression of Clark's situation. Again, to minimize

potential response biases, the strategies were presented in random order.

Finally, the managers were asked to provide demographic information concerning education, position, function, and experience. In addition, they were asked to indicate whether they were members of the top-management teams and whether their CEO's would consider them to be executive or top-level managers.

Statistical Analysis

Initial data analysis focused on descriptive statistics and inter-correlations between independent and dependent variables. In addition, reliability estimates were calculated for each decision frame scale and factor analytic techniques were used to evaluate the adequacy of the scales.

Next, the hypotheses were tested using a two-stage statistical analysis. If the hypothesis involved multiple dependent variables that were intercorrelated, multivariate tests of significance were conducted using canonical correlation analyses. Given significant multivariate F 's, each hypothesis was then tested individually using multiple regression and the individual dependent variables. Cohen and Cohen (1983) have recommended this multi-stage process, using canonical analysis to test overall effects and multiple regression to test an individual hypothesis as an effective means of multivariate analysis. Details of the analytic procedures used with each hypothesis test are given with the presentation of results for each hypothesis. Hierarchical regression was also used to test hypotheses involving single dependent variables.

Chapter 5

Results

Sample

The subjects involved in this study were 180 managers from 98 auto-parts supplier firms in the United States. Twenty-five percent of the participants were presidents or chief executive officers, eleven percent were general managers, sixteen percent were executive vice-presidents, twenty percent were vice-presidents, and fifteen percent were functional managers. Eighty-three percent reported that they were members of the top policy and planning committees in their firms, and eighty-five percent indicated that they were considered executive or top-level managers in their firms. In addition, the participating managers had considerable experience in the industry ($\bar{x}$ =15.5 years), in their positions ($\bar{x}$ =6.0 years), and with their firms ($\bar{x}$ =10.8 years).

In order to gain sufficient sample size and power within the study, the sample was gathered from two slightly different populations of auto-supplier firms. An initial sample of 125 subjects were executive and functional-level managers in 43 auto-supplier firms in Michigan. Data were gathered from these subjects as part of a larger study of auto-supplier strategies. A second sample of 55 subjects were executive-level managers in 55 auto-supplier firms throughout the United States. While both samples responded to identical experimental manipulations and research measures, slightly different administration procedures were used with each sample. With the initial sample the decision frame accessibility measure was administered at the start of a longer

interview on auto-supplier strategies and the scenario was left with the manager to complete and return by mail. The accessibility measure was completed by 138 managers and 125 (89.9%) returned a completed scenario. With the second sample, the accessibility measure and the scenario were mailed to 179 managers and 55 (30.1%) responded by return mail. Table 3 provides demographic data regarding the total sample and each subsample.

Table 3

Demographic Characteristics of Sample

	Michigan	U.S.	Total
<u>Title</u>			
President/CEO	22 (17.7)	23 (41.8)	45 (25.1)
General Manager	8 (6.5)	12 (21.8)	20 (11.2)
Executive VP	20 (16.1)	8 (14.5)	28 (15.6)
Vice President	28 (22.6)	8 (14.5)	36 (20.1)
Manager	46 (37.1)	4 (7.3)	50 (27.9)
$\chi^2 = 30.25***$			
<u>Function</u>			
Purchasing	17 (13.7)	0 (0.0)	17 (9.6)
Production	25 (20.2)	1 (1.9)	26 (14.6)
Marketing	8 (6.5)	8 (14.8)	16 (8.9)
Personnel	1 (0.8)	1 (1.9)	2 (1.1)
Finance	19 (15.3)	2 (3.8)	21 (11.8)
Administration	32 (25.8)	39 (72.2)	71 (40.0)
Engineering	2 (1.6)	0 (0.0)	2 (1.1)
Quality Control	20 (16.1)	1 (1.9)	21 (11.8)
Other	0 (0.0)	2 (3.8)	2 (1.1)
$\chi^2 = 55.92***$			
<u>Highest level of education</u>			
High school grad	4 (3.3)	1 (1.9)	5 (2.8)
Some college	25 (20.3)	5 (9.3)	30 (16.9)
Undergrad-business	37 (30.1)	10 (18.5)	47 (26.6)
Undergrad-other	23 (18.7)	12 (22.2)	35 (19.8)
Graduate-business	24 (19.5)	19 (35.2)	43 (24.3)
Graduate-other	10 (8.1)	7 (13.0)	17 (9.6)
$\chi^2 = 9.80$			
<u>On top policy and planning committee?</u>			
Yes	99 (66.9)	49 (90.7)	148 (83.1)
No	25 (20.2)	5 (9.3)	30 (16.9)
$\chi^2 = 2.46$			
<u>Level of management</u>			
Executive	71 (57.3)	43 (79.6)	114 (64.0)
Top management	32 (25.8)	6 (11.1)	38 (21.3)
Middle level	21 (16.9)	5 (9.3)	26 (14.6)
$\chi^2 = 8.26$			

*** p<.001, ** p<.01, * p<.05

Table 3 (cont'd)

	Michigan	U.S.	Total	t-test
<u>Years in function</u>				
(mean)	12.43	11.63	12.19	0.66
(sd)	7.57	7.20	7.45	
<u>Years in position</u>				
(mean)	5.53	7.04	5.99	-1.61
(sd)	5.36	6.53	5.76	
<u>Years in firm</u>				
(mean)	9.43	13.94	10.80	-2.83**
(sd)	9.39	10.64	9.97	
<u>Years in industry</u>				
(mean)	14.81	16.89	15.45	-1.28
(sd)	9.33	11.21	9.96	

*** p<.001, ** p<.01, * p<.05

As shown in Table 3 there were a number of significant differences between the two subsamples. In particular, the respondents from the United States sample were primarily top-level administrators, while the respondents in the Michigan sample were more evenly distributed across the different functional areas and levels of management. In addition, the United States sample had significantly more experience with their firm than did the Michigan sample. The difference in the two samples was not surprising since the Michigan sample included both top-level and functional-level managers in the participating firms, whereas the mailed survey, used with the United States sample, was sent to each firm's top administrator (e.g., CEO, president, or general manager). To statistically control for these and other potential differences in the two subsamples, the respondent's sample was dummy coded and included in subsequent analyses.

Descriptive Statistics and Correlation Matrix

Prior to testing each hypothesis, means and standard deviations were calculated for all variables included in the study. In addition, correlations for each variable were calculated. These descriptive statistics and a complete zero-order correlation matrix are presented in Appendix F, Table A-2. Correlations for scale items for the decision frame scales are not included in the matrix, but are presented in the following section. The correlation matrix does include the composite score for the decision frame scales for each part (Internal-1, External-1, etc.). Appendix F, Table A-2 also contains a complete list of variable definitions and dummy codes used in this study.

Reliabilities and Factor Analysis of Dependent Variables

Decision Frame Scales. As mentioned, at the end of each scenario part the respondents completed two four-item scales which were used to measure their evoked decision frame. Reliability coefficients were calculated for both scales for each scenario part. The coefficient alphas for the internal decision frame scales were .92 (Part 1), .85 (Part 2), and .94 (Part 3), while the external scales were .74, .61, and .81 respectively. Based on an examination of the item correlation matrix, the lower alphas for the external frame scales were due to two factors. First, the item correlations between the external scale items were all lower than the item correlations between the internal scale items. Second, one item in the external scale, "Clark's environment presents a number of opportunities ... threats" (Ext 4), had a low correlation with the other items in the external scale, particularly for Part 2. If Ext 4 were dropped from the external scale, the reliability coefficients would be .75, .67, and .82 respectively. Table 4 shows the item correlation matrices for each scale for each scenario part.

Table 4

Decision Frame Scales: Item Correlation Matrices

<u>Part 1</u>									
	Int 1	Int 2	Int 3	Int 4	Ext 1	Ext 2	Ext 3	Mean	SD
Int 1								-.03	2.34
Int 2	.81							-.60	2.43
Int 3	.77	.84						-.21	2.25
Int 4	.65	.66	.74					.14	2.23
Ext 1	.48	.59	.48	.42				-.03	2.16
Ext 2	.37	.36	.29	.20	.58			.50	1.75
Ext 3	.19	.25	.21	.26	.48	.47		.71	1.76
Ext 4	.26	.32	.31	.41	.33	.33	.34	1.09	2.23
<u>Part 2</u>									
	Int 1	Int 2	Int 3	Int 4	Ext 1	Ext 2	Ext 3	Mean	SD
Int 1								.16	1.67
Int 2	.60							.07	1.72
Int 3	.60	.61						-.23	1.60
Int 4	.58	.53	.66					.04	1.86
Ext 1	.18	.40	.21	.15				-.12	1.47
Ext 2	.19	.13	.09	.08	.41			.54	1.47
Ext 3	.09	.00	-.01	.04	.34	.49		.65	1.44
Ext 4	.18	.27	.23	.37	.25	.20	.15	.98	1.98
<u>Part 3</u>									
	Int 1	Int 2	Int 3	Int 4	Ext 1	Ext 2	Ext 3	Mean	SD
Int 1								-.21	1.88
Int 2	.77							-.17	2.18
Int 3	.76	.85						-.29	2.10
Int 4	.77	.83	.84					.01	2.14
Ext 1	.50	.55	.52	.53				-.12	1.72
Ext 2	.36	.40	.37	.41	.66			.27	1.79
Ext 3	.26	.35	.30	.35	.54	.61		.58	1.72
Ext 4	.46	.52	.49	.63	.44	.41	.48	.82	2.13

Note: If $r > .19$, then $p < .01$; if $r > .26$, then $p < .001$.

Further examination of the correlations for between-scale items (see Table 4) indicated that the two scales were intercorrelated. This conclusion was also supported by the significant correlations between the composite scores for the internal and external decision frame scales for each scenario part. As shown in Table 5, the internal and external scale correlation coefficients were all significant at the $p < .001$ level with $r = .51$ (Part 1), $r = .30$ (Part 2), and $r = .60$ (Part 3). However, the low correlations between scales across scenario parts also indicated that the scales were actually measuring different constructs. For example, External-1 and Internal-1 were significantly correlated in Part 1 ($r = .51$, $p < .001$), and External-1 and External-2 were significantly correlated across Parts 1 and 2 ($r = .32$, $p < .001$). However, External-1 was not significantly correlated with Internal-2 ($r = -.01$, $p > .05$). This suggests that the two scales, while intercorrelated within each scenario part, were actually measuring different frames of reference.

Table 5

Composite Score Correlations and Reliability Coefficients

Scale	E1	I1	E2	I2	E3	I3	Mean	SD
External-1	.74						.57	1.48
Internal-1	.51***	.92					-.17	2.08
External-2	.29***	.08	.61				.52	1.09
Internal-2	-.01	.19**	.30***	.85			.01	1.43
External-3	.32***	.06	.46***	.20**	.94		.39	1.47
Internal-3	.09	.26***	.17*	.54***	.60***	.81	-.17	1.92
*** p<.001, ** p<.01, * p<.05								

Note: Coefficient alphas for the scales are shown in the diagonal.

The decision frame scales were further evaluated using principal components analysis with a varimax rotation. Table 6 shows the communalities and rotated factor loadings for each scale item for each scenario part. The Eigenvalues and the percent of variance explained by each factor are also shown. For each scenario part, a two-factor solution was arrived at after three iterations using a selection criteria of an Eigenvalue > 1.00 (Kaiser, 1960). These two factor solutions accounted for 70.1%, 60.7%, and 76.6% of the variance for Parts 1, 2, and 3 respectively.

Table 6

Decision Frame Scales: Rotated Factors and Factor Loadings

	Part 1			Part 2			Part 3		
	Comm	F1	F2	Comm	F1	F2	Comm	F1	F2
Int 1	.799	.87	.20	.640	.79	.11	.791	.87	.19
Int 2	.856	.89	.27	.684	.82	.14	.864	.89	.26
Int 3	.869	.92	.17	.731	.86	.01	.864	.91	.21
Int 4	.704	.82	.19	.693	.83	.04	.876	.90	.28
Ext 1	.669	.43	.70	.537	.26	.69	.693	.41	.72
Ext 2	.666	.16	.80	.663	.05	.81	.763	.19	.85
Ext 3	.672	.03	.82	.641	-.08	.80	.758	.11	.86
Ext 4	.371	.26	.55	.268	.38	.35	.517	.51	.51
Eigenvalue	4.23	1.37		3.17	1.69		4.81	1.31	
Variance	52.9%	17.2%		39.6%	21.1%		60.2%	16.4%	
Total Variance		70.1%			60.7%			76.6%	

Comm: Communalities

For all three scenario parts the items from the internal scale loaded on the first factor with rotated factor loadings ranging from .79 to .91. With regards to the external scale, in all but one case, the scale items loaded on the second factor. One item in the external scale, Ext 4, had considerably lower factor loadings on the second factor (.55, .35, and .51) than did the other external items, and actually loaded on the first factor for Part 2. The communalities for Ext 4 were also lower (.37, .27, and .51) than the communalities for the other seven items included in the analysis which averaged .74 (Part 1), .65 (Part 2), and .80 (Part 3) respectively.

In conclusion, the results of the reliability and principal components analyses suggest that, in general, both scales had adequate reliabilities (Nunnally, 1978) and conformed to the expected factor structures. Of the two scales, the internal scale, used to measure strength and weakness decision frames, was superior to the external scale which was used to measure opportunity and threat frames. One item in the external scale was particularly problematic -- "Clark's environment presents a number of opportunities ... threats" (Ext 4). Although consideration was given to excluding this item from the scale, the item was retained because of its high face validity and the minimal increase in reliability that would occur if the item were dropped. Supplemental analyses, however, were also conducted to determine whether the reported findings would differ if Ext 4 were excluded from the scale. The results of these analyses are reported in conjunction with each hypothesis.

Corporate-level Strategies. A principal components analysis was also completed for the eleven corporate-level strategy variables in order to reduce the number of dependent variables and identify any underlying patterns among the eleven strategies. The analysis resulted in a four-factor solution which accounted for 60.4% of the variance. An Eigenvalue > 1.00 (Kaiser, 1960) was again used as the criteria for retaining a factor. Table 7 shows the varimax rotated factor loadings and communalities for each strategy, the Eigenvalues, and percent of variance explained by each factor.

Table 7

Corporate-level Strategies: Rotated Factors and Factor Loadings

Corporate- Strategy	Communality	Factor 1 (RDS)	Factor 2 (WS)	Factor 3 (UDS)	Factor 4 (CS)
Product development	.707	.84	-.02	.03	.07
Market development	.407	.63	-.01	-.09	.03
Concentric diversification	.485	.56	-.10	.39	.07
Divestment	.748	-.16	.83	.15	-.06
Retrenchment	.690	.13	.81	.04	-.13
Liquidation	.638	-.53	.59	.01	.10
Forward integration	.711	.09	-.11	.79	-.25
Conglomerate diversification	.536	-.09	.14	.71	.04
Backward integration	.506	.06	.15	.68	.13
Concentration	.687	-.13	-.19	-.08	.79
Horizontal integration	.530	.30	.05	.08	.66
	Eigenvalue	2.27	2.03	1.21	1.13
	Variance	20.7%	18.5%	11.0%	10.3%

RDS: Related-diversification strategy factor

WS: Withdrawal strategy factor

UDS: Unrelated-diversification strategy factor

CS: Concentration strategy factor

While no hypotheses were stated concerning the factor structure of the corporate-level strategies, the results suggested four relatively clean factors. Using the previously described definitions of each strategy, the first strategy factor was described as related-diversification (RDS). The three corporate-strategies loading of this factor (i.e., product development, market development, and concentric diversification) were defined as growth strategies into related markets or related products, which were accomplished either through expansion of the firm's current operations or the establishment of a new business. The second strategy factor was described as withdrawal (WS), since divestment, retrenchment, and liquidation strategies loaded most heavily on this factor. Each of the strategies loading on this second factor involved retraction from the current business which differed in their degree of permanence (e.g., temporary or permanent withdrawal) and magnitude (e.g., partial or complete withdrawal). The third strategy factor was described as unrelated-diversification (UDS) Forward integration, backward integration, and conglomerate diversification loaded onto this third factor. These strategies were also defined as growth strategies. However, in contrast to the related diversification strategies, each of these strategies was accomplished by establishing new operations in the distribution channels, supply channels, or other unrelated business. Finally, concentration and horizontal integration loaded onto the fourth strategy factor which was described as concentration (CS). Horizontal integration and concentration were also defined as growth strategies but with the current product and within the current market, which were accomplished either through internal growth,

or acquisition of a competitor. Thus, these two strategies did not suggest any diversification into other markets, other products, or other businesses as did the related and unrelated-diversification strategies.

Using a factor loading greater than .50 as a criteria, 10 of the 11 strategies loaded on one and only one of the four factors.

Liquidation was the only strategy that loaded on two factors. On the related-diversification factor it loaded negatively, while on the withdrawal factor it loaded positively.

Factor scores for each of these strategy factors were saved and used in the subsequent analyses of H5 and H6.

Hypothesis 1 Results

H1: The decision frame a decision maker initially evokes will be a function of the distinctiveness of the data and the relative accessibility of the decision frame.

H1a: Distinctive attribute data will result in the decision maker evoking the decision frame associated with the distinctive data.

H1b: Equivocal data will result in the decision maker evoking the more accessible decision frame.

The first part of this hypothesis (H1a) predicted that when distinctive data were available for one of the four decision frames, the managers would evoke the decision frame associated with the distinctive data. For example, if the managers had available distinctive threat data, data that suggested probable losses due to internal sources, the managers were predicted to evoke a threat decision frame.

Alternatively, H1b predicted that when the available data were equivocal, the decision frame the managers evoked would be determined by which frame of reference was more accessible. While H1b broadly suggests that given equivocal data managers will evoke the more accessible decision frame, equivocality within this study was operationalized only in terms of one of the dimensions along which the four decision frames were defined.

The four decision frames used in this study were defined along two underlying dimensions: positive/negative and internal/external. The positive/negative dimension referred to whether the probable outcomes were indicative of gains or losses, while the internal/external dimension referred to the source or locus of those probable outcomes. Within this study, equivocality was operationalized along the

internal/external dimension. Thus, in testing H1b, the focus was on whether the managers would evoke an internal or external frame of reference when given data that were equivocal with respect to internal or external sources of probable outcomes. Within this study the value of the probable outcomes (i.e., positive/negative) was never equivocal, but was always distinctive in that it suggested gains or losses. Consequently, the relative accessibility of internal or external frames of reference only determined whether the managers would evoke an internal or external frame of reference, while the value of the outcomes determined which specific decision frame would be evoked within the particular frame of reference. Thus, when equivocal data were present, managers with a chronic internal frame of reference were predicted to evoke a strength decision frame when the data suggested gains and a weakness decision frame when the data suggested probable losses, while those managers with a chronic external frame of reference were predicted to evoke an opportunity decision frame when the data were suggestive of gains and a threat decision frame when the data were suggestive of losses.

Analytic Procedures. Canonical correlation analysis and hierarchical multiple regression were used in the evaluation of H1. The canonical analysis was used to test for multivariate effects, while the regression analysis was used in the substantive interpretation of results.

The dependent variables in these analyses were the managers' decision frame scores for Part 1. The External Decision Frame Scale measured the extent to which the managers evoked opportunity or threat

decision frames (i.e., External-1) and the Internal Decision Frame Scale measured the extent to which the managers evoked strength or weakness decision frames (i.e., Internal-1). Scores on both scales could range from -4 to +4. In the canonical analysis both decision frame scales were evaluated simultaneously. In the regression analysis separate equations were calculated for each decision frame scale as the dependent variable.

The independent variables included the distinctiveness of the attribute data, the value of the attribute data, the managers' decision frame accessibility scores, and the interactions among these variables. Because three experimental conditions were associated with the distinctiveness of the attribute data, dummy coding (Cohen & Cohen, 1983) was used to create two dummy variables which would provide orthogonal comparisons of the means between these three experimental groups. The first dummy variable was referred to as "Distinctive-Opportunity/Threat" (Dist-O/T) and represented those managers who received distinctive opportunity/threat data. The second dummy variable was referred to as "Distinctive-Strength/Weakness" (Dist-S/W) and represented those managers who received distinctive strength/weakness data. Figure 9 shows the coding for the dummy variables used with H1. (Variable definitions and dummy codes are also presented at the bottom of each table and in Appendix F, Table A-2.)

Figure 9

H1: Coding of Dummy Variables

Experimental Group	Dummy Variable	
	Dist-O/T	Dist-S/W
Distinctive Opportunity/Threat	1	0
Equivocal	0	0
Distinctive Strength/Weakness	0	1

The next variable in the equation was the value of the attribute data presented in the scenario. If the data suggested probable gains, the value of the data were considered "positive", while data which suggested probable losses were considered "negative". In effect, this variable reflected the positive/negative dimension along which the four decision frames were defined which was manifested in the opposing ends on each decision frame scale. This third variable was referred to in the analysis as "Value" and was also dummy coded (negative=-1 and positive=+1).

The fourth variable in the equation was the managers' decision frame accessibility score (Access) which was based on the free-recall task. Accessibility scores ranged from -3.0 to +3.0. A positive value for Access indicated that an internal frame of reference was more accessible, while a negative value indicated that an external frame of reference was more accessible.

These variables (Access, Value, Dist-O/T, Dist-S/W), their two-way interactions (Access X Value, Access X Dist-O/T, Access X Dist-S/W, Value X Dist-O/T, Value X Dist-S/W), and their three-way interactions (Access X Value X Dist-O/T, Access X Value X Dist-S/W) constituted the independent variables in this analysis.

Based on the above coding scheme, H1a would be supported if there were a significant effect for the two-way interaction Value X Dist-O/T when External-1 was the dependent variable and Value X Dist-S/W when Internal-1 was the dependent variable. A significant effect for Value X Dist-O/T when External-1 was the dependent variable would indicate that managers who received distinctive opportunity/threat data of a given

value were more likely to evoke the decision frame associated with that data than managers who received equivocal data or distinctive strength/weakness data. A significant effect for Value X Dist-S/W when Internal-1 was the dependent variable would indicate that managers who received distinctive strength/weakness data of a given value were more likely to evoke the decision frame associated with those data than managers who received equivocal data or distinctive opportunity/threat data. There was no hypothesized main effect for Dist-O/T or Dist-S/W, since the extent to which the managers would evoke a particular frame of reference was dependent on both the probable outcomes (i.e., gains/losses) and the source of those outcomes (i.e., internal/external). Finally, given the dummy coding scheme used with H1, the regression coefficients for these two variables should be positive.

H1b would be supported if the three-way interaction for Access X Value X Dist-S/W were significant when External-1 was the dependent variable and the three-way interaction for Access X Value X Dist-O/T were significant when Internal-1 was the dependent variable. These significant three-way interactions would indicate that in the presence of equivocal data of a given value, managers were more likely to evoke the accessible frame of reference than the less accessible frame of reference. In addition, given the coding scheme used here the regression coefficient for the interactions should be positive when the internal decision frame (Internal-1) was more accessible and negative when the external decision frame (External-1) was more accessible.

Finally, besides these independent variables, the managers' sample (Sample) was dummy coded and included as a control variable in the analysis because of the observed differences between the two subsamples (Michigan=0 and U.S.=1).

Hypothesis Test. The canonical analysis showed a significant multivariate effect ($F=24.43$, $df=24,324$, $p<.001$) for the independent variables on the managers' decision frame scores at the end of Part 1. Two significant canonical variates were identified in the analysis, with canonical correlations of $R_{c1}=.74$ ($p<.001$) and $R_{c2}=.43$ ($p<.001$) respectively. Redundancy coefficients for the dependent variable set (R^2_{dy}) were calculated for each canonical variate and summed to provide an overall estimate of the variance explained in the dependent variable set by the independent variable set (Cohen & Cohen, 1983; Cooley & Lohnes, 1971; Stewart & Love, 1968). The overall variance explained by the two canonical variates was $R^2_{dy}=.65$.

Given this significant multivariate effect, hierarchical regressions were performed using each of the decision frame scales as a dependent variable. In each equation the control variable (i.e., Sample) was entered first. A manager's decision frame accessibility score (Access) was entered next into the equation since it had causal precedence. This was followed by the other main effect variables, which were entered simultaneously, the two-way interactions, and the three-way interactions. This approach follows Cohen and Cohen's (1983) recommendation concerning the application of hierarchical regression. Specifically, they suggest that variables should be entered into the equations according to their causal order, that main effects should be

entered prior to interactions, and that two-way interaction should be entered before three-way interactions.

Table 8 shows the regression equations for the two decision frame scales. In the first equation the managers' external decision frame scores (External-1) were used as the dependent variable. In the second equation the managers' internal decision frame scores (Internal-1) were used as the dependent variable. The table shows the change in R^2 when each variable was entered into the equation, and the unstandardized regression coefficients and standard errors for the final equations with all variables entered. Unstandardized regression coefficients are shown since there were some differences in cell size across conditions (Cohen & Cohen, 1983). Overall, the independent variables accounted for approximately 54% of the variance in the managers' external decision frame scores (i.e., External-1) and 71% of the variance in their internal decision frame scores (i.e., Internal-1).

Table 8

H1: Hierarchical Regressions

Variable	External-1				Internal-1			
	b	se	R ² Δ	R ²	b	se	R ² Δ	R ²
Sample	-.30	(.17)	.01	.01	.07	(.19)	.00	.00
Access (A)	.00	(.06)	.00	.01	.01	(.06)	.04**	.04
Value (B)	.58	(.12)	.40***		1.12	(.13)	.55***	
Dist-O/T (C)	-.25	(.19)	.01		.59	(.21)	.01*	
Dist-S/W (D)	.06	(.19)	.00	.41	.22	(.21)	.00	.61
A X B	.09	(.06)	.01		.05	(.06)	.00	
A X C	.10	(.09)	.00		.18	(.10)	.01	
A X D	-.13	(.09)	.00		.04	(.10)	.00	
B X C	1.25	(.19)	.12***		-.01	(.21)	.00	
B X D	.07	(.19)	.00	.57	1.48	(.21)	.08***	.72
A X B X C	-.02	(.09)	.00		-.04	(.10)	.00	
A X B X D	-.05	(.09)	.00	.57	-.06	(.10)	.00	.72
Constant	.75	(.13)			-.37	(.14)		
	F=18.46 df=12,164 p<.001 R ² _{adj} =.54				F=35.99 df=12,164 p<.001 R ² _{adj} =.70			

*** p<.001, ** p<.01, * p<.05

Note: Unstandardized regression coefficients are shown with standard errors in parentheses.

Sample: Managerial sample (Michigan=0 and U.S.=1).

Access: Managers' accessible decision frame (internal=positive values and external=negative values).

Value: Value of attribute data (negative=-1 and positive=+1).

Dist-O/T: Managers who received distinctive opportunity/threat data (1) versus others (0).

Dist-S/W: Managers who received distinctive strength/weakness data (1) versus others (0).

As demonstrated by the positive regression coefficient and the significant change in R^2 when Value X Dist-O/T was entered into the External-1 equation and Value X Dist-S/W was entered into the Internal-1 equation, the managers did evoke the hypothesized decision frame when presented with distinctive data. For example, when presented with data distinctive of opportunities, the managers' ratings on the External Decision Frame Scale were positive, and when presented data distinctive of threats, the External Decision Frame Scale was rated negatively. This interaction accounted for 12% of the variance in External-1 and 8% of the variance in Internal-1. Thus, H1a was supported in both instances.

There was, however, no significant change in R^2 when the three-way interactions for Access X Value X Dist-O/T and Access X Value X Dist-S/W were entered into each of the equations. Thus, it appeared that decision frame accessibility as operationalized here did not affect the decision frame the managers evoked when presented with equivocal data. Therefore, H1b was not supported.

Using a criteria of $p < .01$, there were two other significant main effects observed in the analysis of H1. First, in both equations "Value" accounted for a substantial portion of the variance in the managers' decision frame scores ($R^2 \Delta = .40$ and $.55$). When the attribute data were positive, suggesting probable gains, the managers' decision frame scores were more positive, and when the attribute data were negative, suggesting probable losses, the managers' decision frame scores were more negative. Thus, the value of the attribute data, and whether it suggests probable gains or probable losses, had a significant

impact on the decision frames the managers evoked. Furthermore, the effects associated with the value of the probable outcomes were significantly greater than the effects associated with the source or locus of those outcomes ($t=4.41$, $p<.001$; Steiger, 1980). Thus, the particular decision frame these managers evoked seemed to be influenced more by whether the data indicated probable gains or losses, than by the locus or source of those probable outcomes.

Second, in the case of the managers' internal decision frame scores, there was a main effect for decision frame accessibility. In particular, the managers were more likely to evoke a strength decision frame when an internal frame of reference was more accessible than when an external frame of reference was more accessible. When an external frame of reference was more accessible, they were more likely to evoke a weakness decision frame. Since this effect was not hypothesized and was only observed with Internal-1, any conclusions concerning the effect of accessibility in this case would be purely speculative.

Next, because of the observed intercorrelation between the two decision frame scales, a manager's complementary decision frame score (CompDFS) was added as an additional covariate to the original equation. CompDFS was the decision frame score which was the compliment of the decision frame score used as the dependent variable in the equation. For example, when the dependent variable was the manager's external decision frame score (External-1), the manager's internal decision frame score (Internal-1) was used as the covariate.

As shown in Table 9, there were only minimal changes in the two equations when the complementary decision frame score was included as an

additional covariate. The independent variables still accounted for approximately the same amount of variance in the decision frame scores ($R^2_{adj} = .57$ and $.72$). Furthermore, the two-way interactions, Value X Dist-O/T and Dist-S/W, were still significant and of the same magnitude as was observed in the original equations. The primary difference in this analysis was that the original variance observed for the value of the attribute data (Value) was now split between Value and the complementary decision frame score (CompDFS). This suggested that the observed intercorrelation between the two decision frame scales was due primarily to the value of the attribute data presented in the scenarios. That is, when given negative data the managers tended to rate both scales negatively and when given positive data they tended to rate both scales positively.

Table 9

H1: Hierarchical Regressions
with Covariate Decision Frame

Variable	External-1				Internal-1			
	b	se	R ² Δ	R ²	b	se	R ² Δ	R ²
Sample	-.31	(.17)	.01	.01	.15	(.19)	.00	.00
CompDFS	.21	(.07)	.26***	.26	.27	(.08)	.26***	.26
Access (A)	.00	(.06)	.01	.27	.01	(.06)	.04**	.30
Value (B)	.34	(.14)	.12***		.96	(.14)	.29***	
Dist-O/T (C)	-.38	(.19)	.01		.66	(.20)	.01*	
Dist-S/W (D)	.01	(.19)	.00	.41	.20	(.21)	.00	.61
A X B	.08	(.05)	.01		.02	(.06)	.00	
A X C	.07	(.09)	.00		.15	(.09)	.01	
A X D	-.13	(.09)	.00		.07	(.10)	.00	
B X C	1.25	(.18)	.12***		-.34	(.23)	.00	
B X D	-.25	(.21)	.00	.60	1.46	(.21)	.08***	.74
A X B X C	-.02	(.08)	.00		-.04	(.09)	.00	
A X B X D	-.04	(.09)	.00	.60	-.04	(.10)	.00	.74
Constant	.83	(.13)			-.57	(.15)		
	F=18.72 df=13,163 p<.001 R ² _{adj} =.57				F=35.79 df=13,163 p<.001 R ² _{adj} =.72			

*** p<.001, ** p<.01, * p<.05

Note: Unstandardized regression coefficients are shown with standard errors in parentheses.

Sample: Managerial sample (Michigan=0 and U.S.=1).

Access: Managers' accessible decision frame (internal=positive values and external=negative values).

Value: Value of attribute data (negative=-1 and positive=+1).

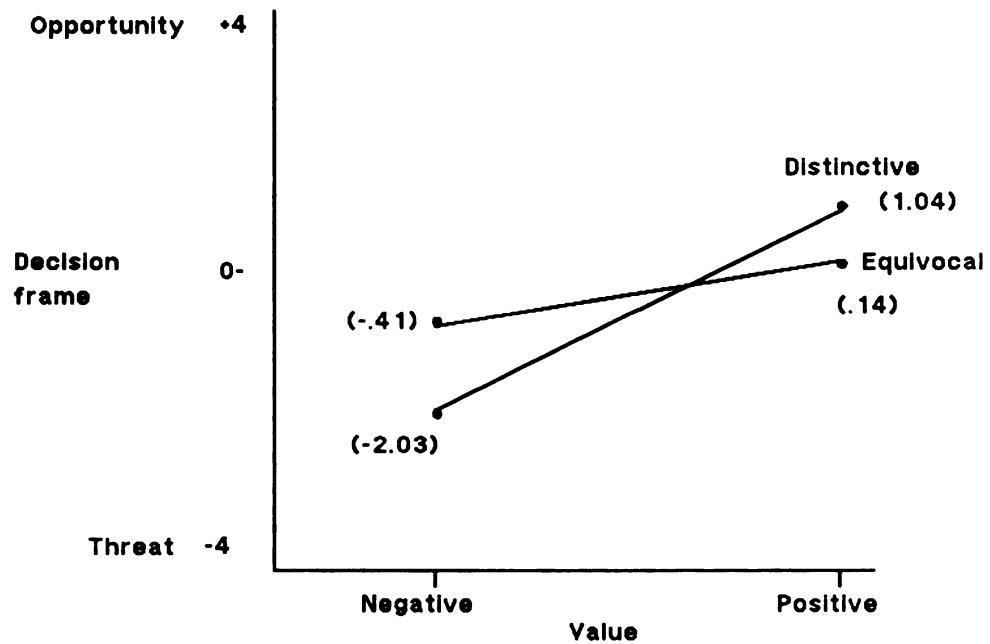
Dist-O/T: Managers who received distinctive opportunity/threat data (1) versus others (0).

Dist-S/W: Managers who received distinctive strength/weakness data (1) versus others (0).

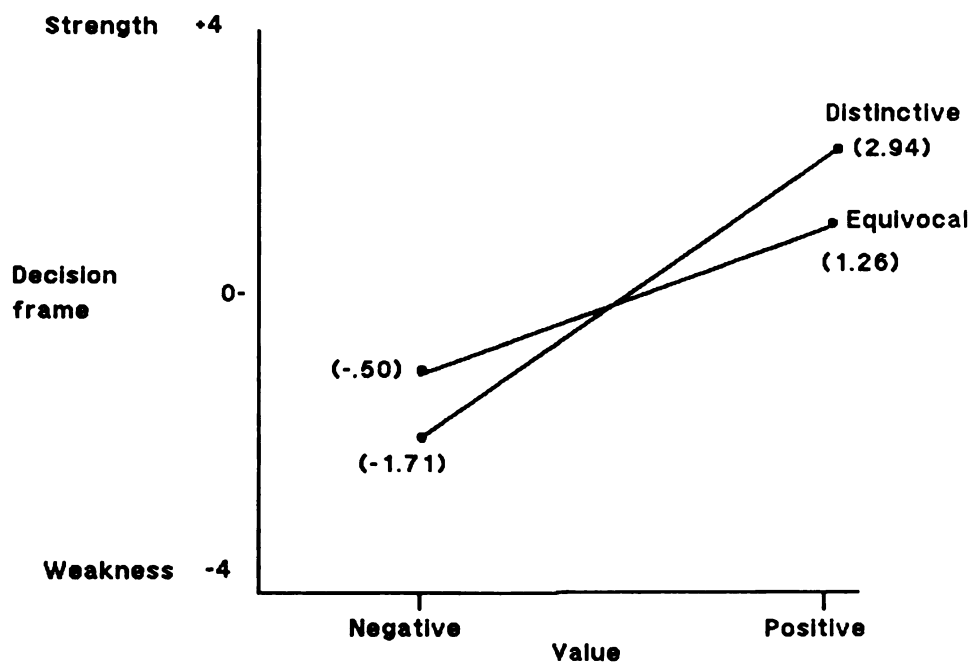
Finally, Figure 10 shows a plot of the interaction between the distinctiveness of the attribute data and the value of the data for both internal and external decision frames.

Figure 10**H1: Distinctiveness by Value Interactions**

(a) External decision frame scale



(b) Internal decision frame scale



Supplemental Analysis. Given the observed difficulty with one item on the external decision frame scale (Ext 4), the above analyses, with and without CompDFS as a covariate, were repeated with Ext 4 excluded from the External-1 scale. The results of those analyses were analogous with the above results in terms of the overall explained variances and the significant effects for Value, Value X Dist-O/T, Value X Dist-S/W, and CompDFS. In addition, there was still no significant effect for the three-way interactions Access X Value X Dist-O/T and Access X Value X Dist-S/W. Thus, H1a was still supported and H1b was still unsupported.

Conclusion. In summary, H1a was supported with regards to the presentation of distinctive data. When presented data distinctive of a threat, the managers evoked a threat decision frame, and when presented with data distinctive of an opportunity, they evoked an opportunity decision frame. When presented data distinctive of a weakness, the managers evoked a weakness decision frame; and when presented with data distinctive of a strength, they evoked a strength decision frame. There was no support of H1b and the hypothesized effect of decision frame accessibility when equivocal data were presented. Finally, although not hypothesized, the value of the attribute data had a significant effect on the managers' frames of reference and this effect occurred irrespective of whether the available data were distinctive or equivocal. In fact, the extent to which the available data suggested gains or losses was more influential in determining which decision frame the managers would evoke than was the source or locus of those gains or losses.

Hypothesis 2 Results

H2: The extent to which a decision maker will evoke an opposing decision frame when given supplemental inconsistent data will be a function of the interaction between the distinctiveness of the initial attribute data and the type of inconsistent data presented (i.e., predictor versus outcome).

H2a: If the initial attribute data are equivocal and supplemental inconsistent predictor data are presented, the decision maker will continue to evoke the initial decision frame.

H2b: If the initial attribute data are equivocal and supplemental inconsistent outcome data are presented, the decision maker will evoke the opposing decision frame.

H2c: If the initial attribute data are distinctive and supplemental inconsistent predictor or outcome data are presented, the decision maker will continue to evoke the initial decision frame.

This hypothesis suggested that the managers would only evoke the opposing frame of reference when the initial data they had available were equivocal, and then only if the new data they had represented outcomes which were inconsistent with their evoked decision frame. Opposing decision frames, as defined earlier, are essentially identical in variable slots and are distinguished primarily in terms of non-overlapping values for those slots. In this study, opportunity and threat frames represented opposing pairs as did strength and weakness. Thus, managers who had evoked an opportunity frame in response to the equivocal data presented in Part 1 were predicted to only evoke a threat frame if the new data in Part 2 represented outcomes associated with threats. If the new data represented predictors associated with threats, the managers were predicted to maintain an opportunity frame.

The managers were also predicted to maintain an opportunity frame if the initial data had been distinctive of an opportunity.

Analytic Procedures. Hierarchical regression was used to test H2. Included in the equation as independent variables were the distinctiveness of the data presented in Part 1, the value of the data presented in Part 2, and the type of inconsistent data presented in Part 2. Each of these variables was dummy coded. Specifically, managers who received equivocal data in Part 1 were coded "1" and those who received distinctive data were coded "0". Next, managers who received positive data in Part 2 suggesting probable gains were coded "+1" and those who received negative data suggesting probable losses were coded "-1". Finally, managers who received predictor data in Part 2 were coded "0" and managers who received outcome data were coded "1". These variables were referred to as DistEq, Value, and PredOut, respectively. In addition, the two-way interactions among these three variables were included in the equation (DistEq X Value, DistEq X PredOut, Value X PredOut) as well as the three-way interaction (DistEq X Value X PredOut).

The dependent variable for H2 was each managers' decision frame score for the opposing decision frame (OppDFS). The opposing decision frame score was operationalized as the decision frame score associated with the frame manipulated in Part 2. If the data presented in Part 2 were inconsistent with the manager's evoked frame in Part 1, then the decision frame score for the frame manipulated in Part 2 would reflect the extent to which the manager evoked the opposing decision frame. For example, if a manager had evoked an opportunity frame in Part 1 and

received threat data in Part 2, the external decision frame score (External-2) would measure the extent to which the manager evoked a threat frame, the opposing frame, in response to the inconsistent data presented in Part 2.

While each manager completed both decision frame scales at the end of Part 2 (External-2 and Internal-2), only the scale that measured the decision frame manipulated in Part 2 was used in the analysis of H2. Furthermore, since there were no hypothesized differences between internal and external opposing decision frames, the opposing decision frame scores were grouped together for the analysis. This meant that each manager contributed one decision frame score to the analysis depending on which frame was presented in Part 2. So, in the case of those managers who received inconsistent strength or weakness data in Part 2, Internal-2 was used as the dependent variable in the analysis, while External-2 was used for those managers who received inconsistent opportunity or threat data in Part 2.

Finally, H2 assumed that the managers received inconsistent data in Part 2 of the scenario. However, as mentioned in the "Method" chapter, it was not possible to insure that all managers would actually be presented with data that were inconsistent with the decision frame they evoked at the end of Part 1. Consequently, only those 121 managers who received inconsistent data in Part 2 were included in the analysis of H2 and the managers who did not receive inconsistent data were excluded. The decision frame with the highest absolute mean value was considered a manager's evoked decision frame. The manipulation check for data inconsistency in Part 2 provided support for implementing this

procedure. Specifically, there was a significant mean difference in the data inconsistency ratings ($t=1.67$, $p<.05$) between managers who received inconsistent data ($\bar{x}=-.55$) and managers who did not receive inconsistent data ($\bar{x}=.00$).

Three control variables were also included in the equation. First, the subject's sample (Sample) was included to statistically control for the differences between the two subsamples (Michigan=0 and U.S.=1). This control variable was identical to the one used with H1 and was dummy coded in the identical fashion. Second, since the test of H2 involved the grouping of decision frame scores across internal and external frames, the frame (Frame) represented by the attribute data presented in Part 2 was included as a second covariate and was dummy coded (opportunity/threat=1 and strength/weakness=2). Finally, since H2 was concerned with conditions under which managers would change their frames of reference, the managers' previous decision frame scores for the decision frame manipulated in Part 2 were included as a pre-measure (PreDFS). Thus, if the inconsistent attribute data in Part 2 were reflective of strength or weakness, the manager's internal decision frame score at the end of Part 2 (Internal-2) was the dependent variable (OppDFS) and the internal decision frame score at the end of Part 1 (Internal-1) was the pre-measure (PreDFS).

The variables were entered into the equation in the following hierarchical order: the first two control variables (Sample, Frame), the pre-measure for the manipulated decision frame (PreDFS), DistEq, the other main effect variables (Value, PredOut), the two-way interactions with DistEq (DistEq X Value, DistEq X PredOut), the Value X PredOut

interaction, and last the three-way interaction (DistEq X Value X PredOut). The DistEq main effect and interactions were entered prior to the other main effects and interaction since DistEq had causal precedence over the variables manipulated in Part 2.

Using the above equation, H2 would be supported if there were a significant change in R^2 when the three-way interaction DistEq X Value X PredOut was entered into the equation. Given the dummy coding scheme used here, the regression coefficient for this interaction (DistEq X Value X PredOut) should be positive. That is, managers should only evoke an opportunity decision frame when the initial data were equivocal (1) and the new data were reflective of inconsistent outcomes (1) associated with opportunities (+1). Significant main effects for these variables were not hypothesized.

Hypothesis Test. As shown in Table 10, in the first equation, approximately 27% of the variance in the managers' opposing decision frame scores was accounted for by the above analysis ($F=5.48$, $df=10,110$, $p<.001$). Counter to H2b predictions, there was no significant effect for the three-way interaction DistEq X Value X PredOut. Furthermore, the significant effect for Value ($R^2\Delta=.11$) was counter to H2a and H2c, since the results indicated that the managers readily evoked the opposing decision frame irrespective of the equivocality of the data they initially had or the type of inconsistent data they subsequently received. Thus, if the inconsistent data presented in Part 2 were indicative of weakness, the managers evoked a weakness decision frame, and if the inconsistent data were indicative of strength they evoked a

strength decision frame irrespective of the initial data they had or the type of subsequent inconsistent data they received.

Besides the main effect for value, the DistEq X Value ($R^2\Delta=.04$) and Value X Predout ($R^2\Delta=.02$) interactions were also significant. The positive regression coefficient for DistEq X Value ($b=.73$) indicated that when the initial data were equivocal the managers were more likely to evoke the opposing decision frame than when the initial data were distinctive. For example, managers presented with inconsistent strength data in Part 2 were more likely to evoke a strength frame of reference, if the initial data had been equivocal, than if the initial data had been distinctive of a threat. These results were consistent with the predictions of H2.

Table 10

H2: Hierarchical Regressions for Opposing Decision Frame

Variable	Without Covariate DFS				With Covariate DFS			
	b	se	R ² Δ	R ²	b	se	R ² Δ	R ²
Sample	-.33	(.26)	.03		-.23	(.25)	.02	
Frame	-1.03	(.25)	.10***	.12	-.87	(.24)	.09***	.12
PreDFS	.39	(.12)	.01	.14	.33	(.12)	.02	.13
CompDFS	--	--	--	--	.43	(.11)	.12***	.26
DistEq (A)	.49	(.33)	.02	.16	.44	(.31)	.01	.27
Value (B)	.86	(.36)	.11***		.52	(.35)	.07**	
PredOut (C)	.17	(.29)	.00	.27	.21	(.27)	.00	.34
A X B	.73	(.35)	.04*		.84	(.33)	.05**	
A X C	.13	(.52)	.00	.31	-.03	(.49)	.00	.39
B X C	-.39	(.29)	.02*	.33	-.34	(.27)	.02	.41
A X B X C	-.27	(.51)	.00	.33	-.30	(.48)	.00	.41
Constant	1.45	(.46)			1.02	(.44)		
	F= 5.48 df=10,110 p<.001				F=6.85 df=11,108 p<.001			
	R ² _{adj} =.27				R ² _{adj} =.35			

*** p<.001, ** p<.01, * p<.05

Note: Unstandardized regression coefficients are shown with standard errors in parentheses.

Sample: Managerial sample (Michigan=0 and U.S.=1).

Frame: Frame manipulated in Part 2 (external=1 and internal=2).

PreDFS: Decision frame score for OppDFS at end of Part 1.

CompDFS: Managers' complementary decision frame scores (if DV=Internal-2, CompDFS=External-2; if DV=External-2, CompDFS=Internal-2).

DistEq: Managers who received distinctive data (0) versus managers who received equivocal data (1) in Part 1.

Value: Value of attribute data (negative=-1 and positive=+1).

PredOut: Managers who received inconsistent predictor data (0) versus managers who received inconsistent outcome data (1) in Part 2.

However, the negative regression coefficient for Value X Predout ($b = -.39$) was inconsistent with H2 predictions. That is, the managers were more likely to evoke the opposing decision frame when inconsistent predictor data were presented in Part 2 than when inconsistent outcome data were presented. Thus, managers who received predictor data indicative of weakness were more likely to evoke a weakness decision frame than those managers who received outcome data associated with weakness.

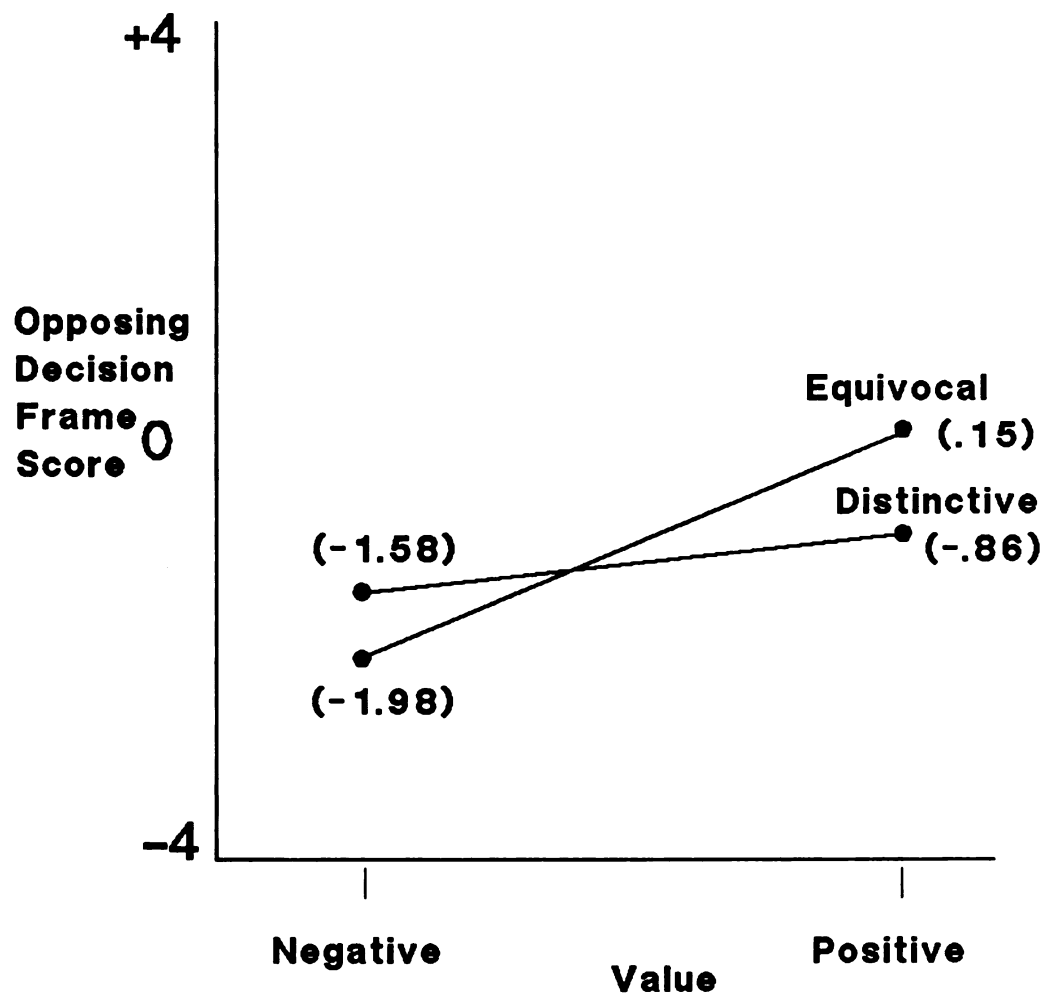
There was also a significant effect for Frame ($R^2\Delta = .10$), one of the control variables, which indicated that there were major differences between the results for internal and external opposing decision frames. Specifically, opposing external (i.e., opportunity/threat) decision frames were rated more positively than were opposing internal (i.e., strength/weakness) decision frames. Consequently, supplemental analyses were conducted to examine these and other differences between internal and external opposing decision frames. These analyses are presented later.

Next, given the high intercorrelation between the internal (Internal-2) and external (External-2) scales ($r = .37$, $p < .001$), the original analysis was repeated with an additional covariate -- the managers' complementary decision frame scores in Part 2 (CompDFS). Given the grouping of internal and external scales that was used in testing H2, the complementary decision frame score was, in effect, the managers' decision frame scores in Part 2 which were not used as the dependent variable. Thus, if Internal-2 was the dependent variable for

a given manager, that manager's External-2 was considered the complementary decision frame score in this analysis.

As shown in Table 10, the addition of the complementary decision frame score to the equation increased the overall explained variance to $R^2_{adj}=.35$ ($F=6.85$, $df=11,108$, $p<.001$). The observed effects for this analysis were similar to those in the original analysis. Specifically, there were still significant main effects for Frame and Value as well as a significant two-way interaction for DistEq X Value. Figure 11 shows a plot of the DistEq X Value interaction. Furthermore, there still was no significant three-way interaction for DistEq X Value X Predout. Thus, H2 was still unsupported.

Figure 11
H2: Distinctiveness by Value Interaction
for Opposing Decision Frame



The main difference in this analysis was the significant effect for CompDFS, which was expected given the correlations between the two scales. In addition, the variance explained by Value dropped from $R^2\Delta=.11$ to $R^2\Delta=.07$ when the complementary decision frame was included as a covariate. This effect was also observed in the supplemental analysis of H1 and again suggests that the covariance in scales was in large part due to the Value of the attribute data presented in Part 2. So, for example, managers who had initially evoked an opportunity frame in response to Part 1 and received threat data in Part 2 were not only likely to reframe the situation as a threat, they were also likely to frame the situation as one in which the firm had internal weaknesses.

Finally, the effect for Value X Predout was not quite significant at the $p<.05$ level when CompDFS was included as a covariate ($t=1.94$, $p=.055$). However, in the original analysis, Value X PredOut had been only marginally significant at this same level ($t=2.00$, $p=.048$). Thus, the results with and without CompDFS seem consistent, even though the effect for Value X PredOut was significant in the original analysis and non-significant in this supplemental analysis.

Supplemental Analysis. The supplemental analysis for H2 focused on two issues. First, given the previously mentioned problems with the external decision frame scale for Parts 1 and 2, the above analysis was repeated without Ext 4 in the external decision frame scales. Second, because of the main effect for Frame in the initial analysis, the above analysis was repeated separately for internal and external opposing decision frames.

To address this first issue, the original analysis was repeated but with Ext 4 excluded from both External-1 and External-2 scales. The results of this analysis were analogous with the above results when CompDFS was or was not included as a covariate. That is, there were still significant effects for Frame, Value, CompDFS, and the DistEq X Value interaction. The only difference in this analysis was the smaller $R^2\Delta$ for CompDFS ($R^2\Delta=.07$ vs. $R^2\Delta=.12$) which indicated that a significant portion of the covariance between the two scales was due to the Ext 4 item.

To address the second issue, a secondary analysis was conducted for opposing internal and opposing external decision frames using the same independent variables and including the managers' CompDFS as a covariate. Of the 121 managers grouped in the original analysis, 75 had been represented by Internal-2 and 46 had been represented by External-2. The only difference in procedures for this secondary analysis was the elimination of Frame as a control variable, since the scores for the two frames (i.e., internal or external) were no longer grouped together. The results of these analyses are shown in Table 11.

In three respects the results of the analysis for internal and external decision frame scores were similar to those of the original analysis. Specifically, there were still main effects for CompDFS and Value as observed in the earlier equations in both the Internal-2 and External-2 equations. In addition, the DistEq X Value interaction was still significant and of comparable effect size ($R^2\Delta=.04$) in the Internal-2 equation. This interaction, however, was not significant in the External-2 equation.

Table 11

**H2: Hierarchical Regressions for
Internal and External Opposing Decision Frames**

Variable	External-2 Scale				Internal-2 Scale			
	b	se	R ² Δ	R ²	b	se	R ² Δ	R ²
Sample	-.16	(.30)	.02	.02	-.22	(.35)	.03	.03
PreDFS	.59	(.15)	.24***	.26	.31	(.20)	.00	.03
CompDFS	.12	(.14)	.07*	.32	.42	(.16)	.16***	.18
DistEq (A)	-.13	(.40)	.04	.36	.26	(.43)	.05*	.24
Value (B)	.34	(.36)	.11**		.96	(.60)	.05*	
PredOut (C)	.48	(.30)	.06*	.51	-.07	(.37)	.00	.29
A X B	.34	(.44)	.01		.69	(.44)	.04*	
A X C	.64	(.67)	.00	.52	.70	(.71)	.00	.33
B X C	.67	(.30)	.07*	.60	-.98	(.37)	.11***	.44
A X B X C	.04	(.64)	.00	.60	-.43	(.71)	.00	.44
Constant	.11	(.25)			-.60	(.28)		
	F=5.16 df=10,35 p<.001				F=4.94 df=10,63 p<.001			
	R ² _{adj} =.48				R ² _{adj} =.35			

*** p<.001, ** p<.01, * p<.05

Note: Unstandardized regression coefficients are shown with standard errors in parentheses.

Sample: Managerial sample (Michigan=0 and U.S.=1).

PreDFS: Decision frame score for OppDFS at end of Part 1.

CompDFS: Managers' complementary decision frame score (if DV=Internal-2, CompDFS=External-2; if DV=External-2, CompDFS=Internal-2).

DistEq: Managers who received distinctive data (0) versus managers who received equivocal data (1) in Part 1.

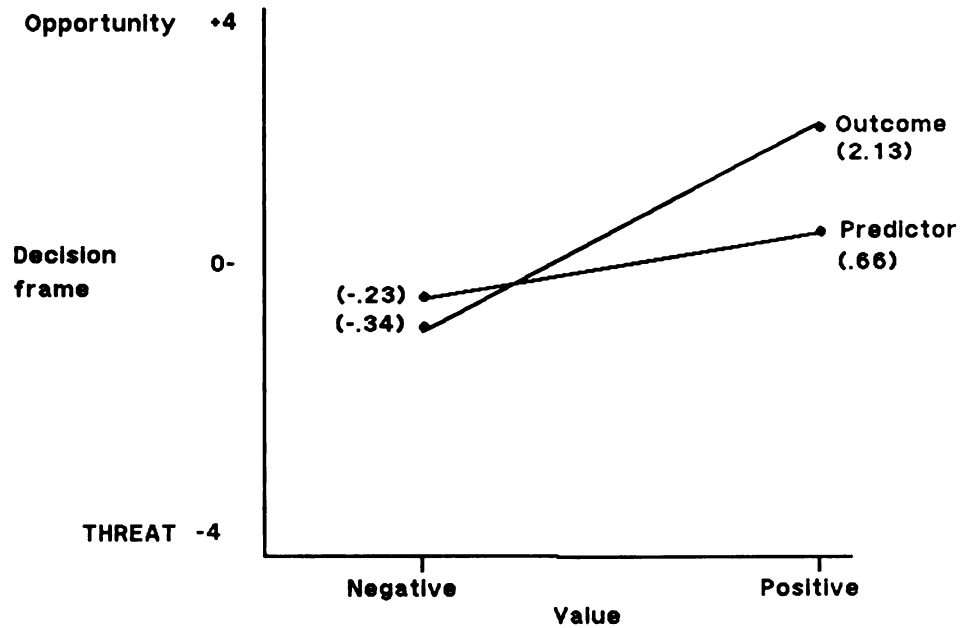
Value: Value of attribute data (negative=-1 and positive=+1).

PredOut: Managers who received inconsistent predictor data (0) versus managers who received inconsistent outcome data (1) in Part 2.

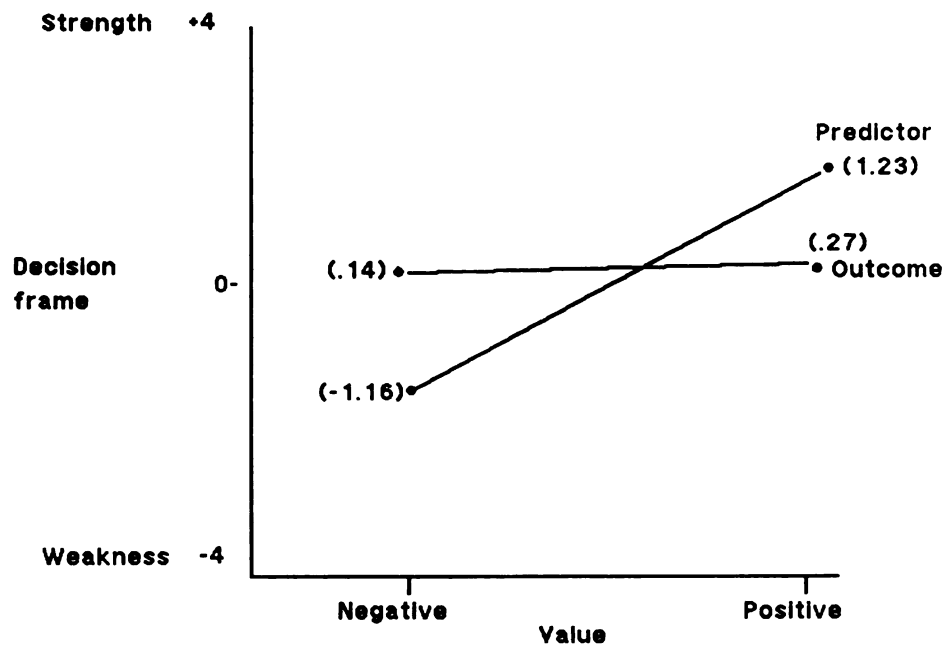
The most striking difference in these two equations was the Value X PredOut interaction which was significant in both equations, but with regression coefficients of opposite signs. In the case of the internal decision frame, the managers were more likely to evoke one of the decision frames if inconsistent predictor data were present. In contrast, managers were more likely to evoke one of the external decision frames if the inconsistent data were indicative of outcomes. Figure 12 shows the predictor-outcome by value interactions for both internal and external decision frame scales.

Figure 12
H2: Predictor-Outcome by Value Interactions

(a) External decision frame scale



(b) Internal decision frame scale



The results for Internal-2 were consistent with the original analysis but were inconsistent with the predictions of H2b, while the results for External-2 were inconsistent with the original results but were consistent with H2b predictions. One possible explanation for this apparent inconsistency across internal and external decision frames may rest with the PredOut manipulation. As mentioned in the Methods chapter, an insufficient number of distinctive outcomes were generated for Part 2. Consequently, outcomes which did not meet the desired significance level had to be used in the PredOut manipulation. In the case of strength/weakness decision frames only one of the three outcomes met the desired criteria and than only marginally ($t=2.05$, $p<.05$). In the case of opportunity/threat decision frames two of the three outcomes met the criteria and were significant at the $p<.01$ level. For both Internal-2 and External-2 the predictor attributes used in Part 2 were all distinctive and met the established criteria. Consequently, the inverse relationship for Value X PredOut observed in Internal-2 may be attributed more to the use of non-distinctive outcomes and distinctive predictors than any substantive variance across internal and external frames of reference.

Finally, the results of this analysis varied from the original analysis in two other respects. First, the PreDFS accounted for considerable variance ($R^2\Delta=.24$) in the managers' external decision frame scores (External-2). This indicated that in the case of opportunity and threat decision frames the managers' initial frames of reference did influence their subsequent impressions of the situation. In all earlier analyses, the lack of effect for PreDFS suggested that the managers'

evoked decision frames at the end of Part 2 were unrelated to their original frames of reference. Second, in the case of External-2, the type of data presented in Part 2 (i.e., predictor vs. outcome) affected the managers' external decision frame scores. Specifically, when the supplemental inconsistent data were representative of outcomes the managers were more likely to evoke an opportunity decision frame than if the data were reflective of predictors. These findings, however, must be considered speculative, since they were not hypothesized and were not replicated across both internal and external frames of reference.

Conclusion. In summary, H2 was not supported. First, none of the above analyses demonstrated the necessary three-way interaction between the value of the data, the distinctiveness of the initial data, and the type of supplemental inconsistent data presented in Part 2. Second, as demonstrated by the significant effect for Value, the managers readily changed their frames of reference when presented with inconsistent data. If the inconsistent data suggested gains, the managers evoked a more positive frame of reference (i.e., opportunity or strength), and if the data were suggestive of losses, they evoked a more negative frame of reference (i.e., threat or weakness).

However, this does not mean that the initial data or the type of supplemental inconsistent data did not make a difference. Given initially equivocal data, the managers were more likely to evoke the opposing decision frames than if the initial data had been distinctive. These findings were consistent with the pattern of relationships suggested by H2. In addition, in the case of External-2, the results concerning the type of supplemental inconsistent data presented,

predictor or outcome, were in the direction suggested by H2. That is, managers who received opportunity or threat outcome data in Part 2 were more likely to change their frames of reference than managers who received opportunity or threat predictor data. However, in the case of Internal-2, the results were in the opposite direction suggested by H2. Thus, there was some evidence that the managers were more likely to evoke the opposing decision frames when they had initially equivocal data, or when the supplemental data they received were reflective of outcomes inconsistent with their evoked frames of reference.

Hypothesis 3 Results

H3: The extent to which a decision maker will evoke a complementary decision frame when given supplemental inconsistent data will be a function of the interaction between the distinctiveness of the initial attribute data and the type of inconsistent data presented (i.e., predictor versus outcome).

H3a: If the initial attribute data are equivocal and supplemental inconsistent predictor data are presented, the decision maker will not evoke the complementary decision frame.

H3b: If the initial attribute data are equivocal and inconsistent outcome data are presented, the decision maker will evoke the complementary decision frame.

H3c: If the initial attribute data are distinctive and supplemental inconsistent predictor or outcome data are presented, the decision maker will not evoke the complementary decision frame.

Reframing, as conceptualized here, meant not only that the managers would evoke the opposing decision frames in response to supplemental inconsistent data (H2), but that they would also evoke the complementary decision frame which fit the original data (H3). In fact, this was the definitive test of reframing. If the managers evoked the complementary decision frame in Part 2 which was consistent with the original data, this would provide evidence that the managers were actually reinterpreting the original facts from a new perspective.

Complementary decision frames were defined here as decision frames which shared only a few variable slots with overlapping values and were distinguished primarily in terms of non-overlapping variable slots. Within this study opportunity and strength decision frames were considered complementary decision frames as were threat and weakness.

According to H3b, the managers were predicted to evoke the complementary decision frame which fit the original data if the initial data were equivocal and the supplemental data were reflective of outcome inconsistent with the managers' evoked frames of reference. For example, if the managers had evoked a threat decision frame in response to equivocal data suggesting losses in Part 1, they were predicted to evoke a weakness decision frame in Part 2 as an alternative explanation of the probable losses in Part 1, if the supplemental inconsistent data presented in Part 2 were reflective of outcomes associated with opportunities.

Analytic Procedures. H3 was tested in the identical manner as H2. However, instead of using the decision frame score for the opposing decision frame pair (OppDFS) as the dependent variable, the managers' complementary decision frame score (CompDFS) was the dependent variable in this analysis. So, rather than using the internal decision frame score (Internal-2) when Part 2 presented inconsistent strength or weakness data, the external decision frame score (External-2) was used as the dependent variable, since it would measure the degree to which the complementary decision frame was evoked. In all other ways the regression equations and analytic procedures for H3 were identical to those used in H2. Specifically, the same variables were entered into the hierarchical regression equation in the same order and with the same dummy coding scheme. In addition, since there were no hypothesized differences between Internal-2 and External-2, the decision frame scores were again grouped together for the analysis. Furthermore, as with H2,

only those 121 managers who received inconsistent data were included in this analysis.

Like H2, H3 proposed a significant three-way interaction between the initial type of data (distinctive vs. equivocal), and the value (positive vs. negative) and type of inconsistent data presented in Part 2 (predictor vs. outcome). However, given the contrast coding scheme used here, the regression coefficient for the DistEq X Value X Predout interaction should be negative in the case of H3 rather than positive as was the case in H2. That is, if reframing occurred, the managers' complementary decision frame scores should match the value of the original data which were, by design of the study, opposite in value to the supplemental inconsistent data presented in Part 2. In addition, there should be no main effects or two-way interactions for any of the other variables, since the hypothesis predicted that the managers would not evoke the complementary frame of reference unless the above conditions were met.

Hypothesis Test. As shown in Table 12, 25% of the variance in the managers' complementary decision frame scores was accounted for by the above analysis. However, there was no support for H3b, since the effect for the DistEq X Value X PredOut interaction was not significant ($t = -.99$, $p > .05$). In addition, there was a significant effect for Value ($R^2\Delta = .19$) indicating that the managers readily evoked the complementary frame. Furthermore, the positive regression coefficient ($b = .50$) for Value indicated that the complementary decision frame the managers evoked was not congruent with the original data, but was of the same value as the inconsistent data presented in Part 2. Consequently, activation of the

complementary decision frame in this case was not evidence of reframing, since reframing required that the complementary frame fit the original data. The above results suggest again that the managers' frames of reference were heavily influenced by the value of the inconsistent data presented in Part 2.

Finally, in contrast to H2, there was a significant effect for PreDFS ($t=3.18$, $p<.01$) and the effect for Frame ($t=1.47$, $p>.05$) was not significant. Thus, in the case of the complementary decision frame, the managers' initial frames of reference did influence their subsequent ones. This was not the case with the opposing decision frame. In addition, the non-significant effect for Frame suggested that the factors influencing activation of the complementary decision frame were similar for both internal and external frames of reference.

Table 12

H3: Hierarchical Regressions for Complementary Decision Frame

Variable	Without Covariate DFS				With Covariate DFS			
	b	se	R ² Δ	R ²	b	se	R ² Δ	R ²
Sample	-.07	(.19)	.00	.00	.02	(.18)	.00	.00
Frame	-.60	(.18)	.02	.02	-.30	(.19)	.02	.02
PredDFS	.49	(.09)	.08**	.10	.44	(.08)	.08**	.10
OppDFS	--	--	--	--	.24	(.06)	.09***	.20
DistEq (A)	.24	(.24)	.01	.11	.11	(.23)	.00	.20
Value (B)	.50	(.14)	.19***		.51	(.14)	.16***	
PredOut (C)	-.05	(.21)	.00	.30	-.10	(.20)	.00	.36
A X B	.01	(.24)	.00		-.26	(.23)	.02*	
A X C	.19	(.37)	.00	.30	.22	(.35)	.00	.39
B X C	.11	(.21)	.00	.30	.18	(.20)	.00	.39
A X B X C	-.37	(.37)	.01	.31	-.30	(.35)	.00	.39
Constant	1.12	(.32)			.68	(.32)		
	F=4.88 df=10,109 p<.001				F=6.35 df=11,108 p<.001			
	R ² _{adj} =.25				R ² _{adj} =.33			

*** p<.001, ** p<.01, * p<.05

Note: Unstandardized regression coefficients are shown with standard errors in parentheses.

Sample: Managerial sample (Michigan=0 and U.S.=1).

Frame: Frame manipulated in Part 2 (external=1 and internal=2).

PredDFS: Decision frame score for OppDFS at end of Part 1.

OppDFS: Managers' opposing decision frame scores (if DV=Internal-2, OppDFS=External-2; if DV=External-2, OppDFS=Internal-2).

DistEq: Managers who received distinctive data (0) versus managers who received equivocal data (1) in Part 1.

Value: Value of attribute data (negative=-1 and positive=+1).

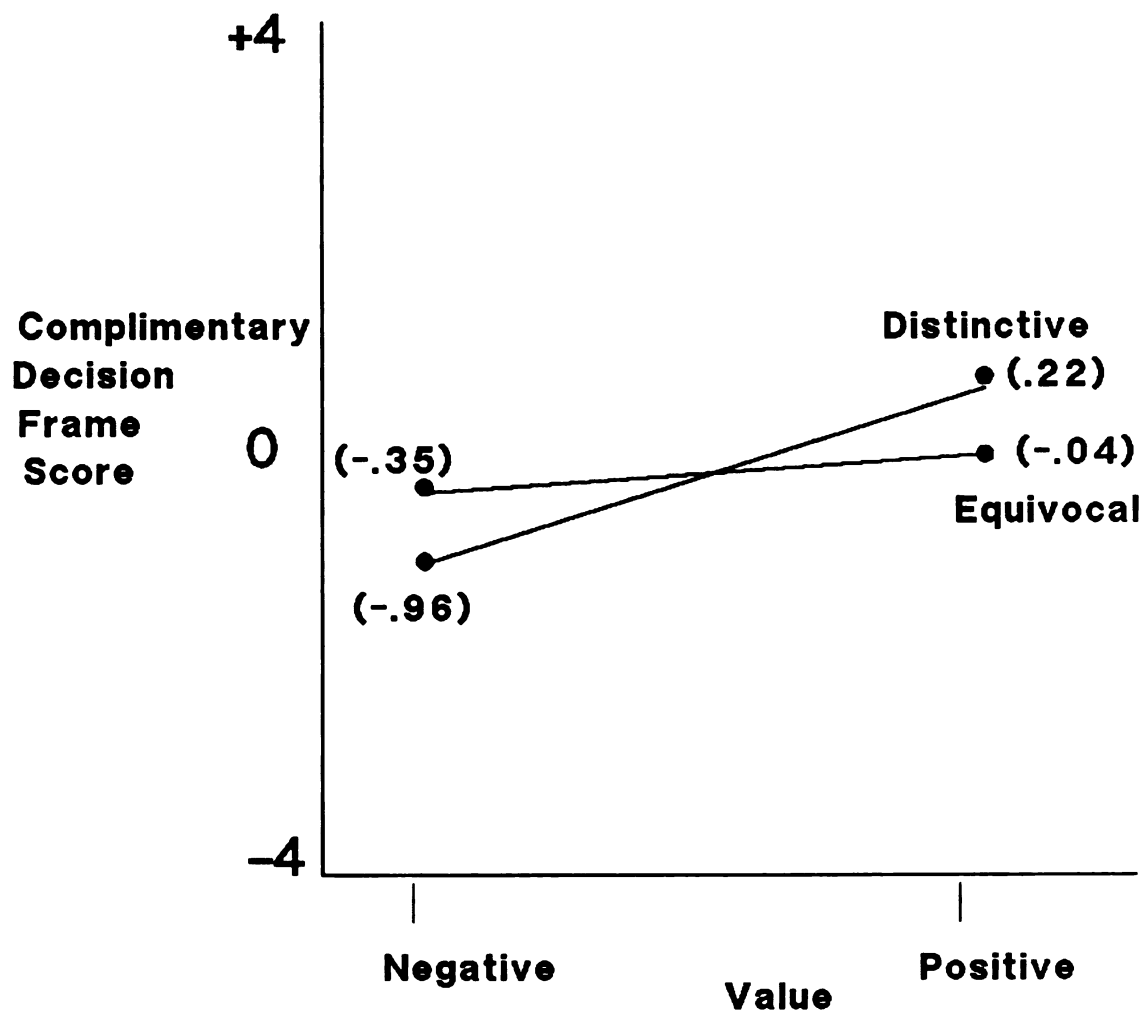
PredOut: Managers who received inconsistent predictor data (0) versus managers who received inconsistent outcome data (1) in Part 2.

As with the earlier hypotheses, the above analysis was repeated with the managers' other decision frame scores as an additional covariate. In the case of H3, the managers' opposing decision frame scores (OppDFS), as defined for H2, represented the covariate decision frame in this analysis. In all other ways the regression equation with OppDFS as a covariate was identical to the original equation.

As shown in the second equation in Table 12, there was a significant effect for OppDFS ($R^2\Delta=.09$) and adding OppDFS to the equation increased the overall variance explained to $R^2_{adj}=.33$. In addition, the effects for PreDFS ($R^2\Delta=.08$) and Value ($R^2\Delta=.19$) were still present and of comparable magnitude to those observed when OppDFS was not included as a covariate.

The most interesting consequences of including OppDFS as a covariate in the equation was the now significant effect observed for the DistEq X Value interaction ($t=2.11$, $p<.05$) and, in particular, the negative regression coefficient for this interaction ($b=-.26$) which suggested that some degree of reframing may have occurred. Given the contrast coding scheme used here, the significant negative regression coefficient for DistEq X Value indicated the managers were more likely to evoke a complementary decision frame which fit with the original data when the original data were equivocal than when they were distinctive. Figure 13 shows a plot of the DistEq X Value interaction. These results were consistent with the pattern of relationships suggested by H3b and the conceptual framework presented here.

Figure 13
H3: Distinctiveness By Value Interaction
For Complimentary Decision Frame



Finally, it should also be noted that there were no significant main effects or interactions for the PredOut variable. Thus, there was no evidence that the predictors or outcome attributes were more influential in leading the managers to evoke the complementary decision frame as was observed in the case of the opposing decision frame.

Supplemental Analysis. As with the previous hypotheses, the supplemental analysis for this hypothesis focused on the effect of excluding Ext 4 from the external decision frame scales. In the case of H3, separate analyses were not completed for internal and external decision frames since the effect for Frame had been non-significant in the original analysis.

In this supplemental analysis, Ext 4 was excluded from both External-1 and External-2 scales. In all other respects the analysis was identical to the original analysis with hierarchical regression equations being computed with and without OppDFS as a covariate.

The results of these analyses were similar to those reported above. There still was no effect for the DistEq X Value X PredOut interaction with or without OppDFS as a covariate, and there still were main effects for PreDFS and Value in both equations. The effect for the OppDFS in this analysis ($R^2\Delta=.03$) was substantially smaller than in the original analysis ($R^2\Delta=.09$), which again suggested that a substantial portion of the covariance between the two decision frame scales was due to the Ext 4 item. In addition, there was a marginally significant effect for Frame ($t=2.04$, $p<.05$) in both equations which was not observed in the original analysis and the effect for the DistEq X Value was no longer significant ($t=1.35$, $p>.05$).

Conclusion. There was no support for H3 as proposed. First, none of the analyses demonstrated a significant effect for the DistEq X Value X PredOut interaction. Second, while the results indicated that the managers readily evoked a complementary frame in response to any inconsistent data, the complementary frame they evoked was congruent with the supplemental data and not the original data. Thus, it does not appear that the managers were reframing, or reinterpreting the original data from a different perspective. Rather, as was observed with H2, the value of the data and whether it suggested gains or losses dominated the managers' ratings.

There was, however, some evidence that reframing may have occurred. Specifically, the negative regression coefficient for the DistEq X Value interaction indicated to some degree some managers did appear to evoke a decision frame which was congruent with the original data if the original data were equivocal. Of DistEq and PredOut, the two variables considered to influence reframing, the former was by far the more critical with respect to the underlying conceptual model. That is, equivocality, defined here by overlapping variable slots, was the fundamental and necessary condition for reframing to occur. Thus, the effect for DistEq X Value does provide some limited evidence of the reframing process as proposed in this study.

Hypothesis 4 Results

H4: For decisions initially framed in response to distinctive data, the decision maker will evoke the opposing decision frame when given supplemental stable outcome data. If the supplemental data are indicative of unstable outcomes, the decision maker will continue to evoke the initial decision frame.

This hypotheses was essentially an extension of H2c in that it predicted those conditions under which managers would evoke the opposing decision frames if they had received initially distinctive data. As described earlier, H2 proposed that when the initial data were distinctive, the managers would maintain their initial frames of reference irrespective of the type of supplemental inconsistent data they received in Part 2. In an effort to explain when these managers would change their frames of reference, H4 predicted that if the managers received additional outcome data in Part 3 which were stable with respect to the data in Part 2, they would then evoke the opposing decision frame. Thus, while H2 suggested that inconsistent outcome data based on a single observation (Part 2) would not lead the managers to evoke the opposing decision frames, H4 suggested that multiple observations (Parts 2 and 3) of the same outcomes would lead the managers to evoke the opposing decision frames.

Stable outcomes were defined here as outcome attributes for the same decision frame over two time periods and were operationalized by presenting identical outcomes in Parts 2 and 3. Unstable outcome attributes were operationalized by presenting outcomes in Part 3 for the opposing frame (opposite value) to the outcomes presented in Part 2. So, if the initial data the managers had were distinctive of a threat,

and if the inconsistent data they received in Part 2 were indicative of opportunity outcomes, the managers were not supposed to evoke the opposing opportunity decision frame (H2). However, they were predicted to evoke the opposing opportunity decision frame if Part 3 of the scenario also presented opportunity outcomes (e.g., stable) and not threat outcomes (e.g., unstable). Finally, since stability had a temporal element, the instructions to Part 3 indicated that the data presented in Part 3 reflected Clark's situation two years later. These instructions were added so that the managers would not assume that the data in Parts 2 and 3 were for the same point in time.

As demonstrated by the findings for H2, the managers in this study readily evoked the opposing decision frames even when the data were distinctive and irrespective of the type of inconsistent data presented (predictor vs. outcome). Thus, the underlying premise upon which H4 was predicated was not demonstrated in the analysis for H2. Consequently, H4 could not be tested as planned. The analysis of H2, however, did show a significant effect for DistEq X Value which indicated that the managers who received initially distinctive data were less likely to evoke the opposing decision frames than those who received equivocal data. Consequently, the test of H4 was modified to assess whether the stability of the outcomes would have an additional effect above and beyond that already observed in H2.

Analytic Procedures. Hierarchical regression was used to evaluate H4. Included in the equation as independent variables were the value of the data presented in Part 3 and the stability of the data presented in Part 3. Both of these variables were dummy coded. The first variable

was referred to as Value; managers who received negative data in Part 3 were coded "-1" and managers who received positive data were coded "+1". This was similar to the dummy coding of the Value variable used in H2 and H3, but in this case it represented the value of the data presented in Part 3 of the scenario. The second dummy variable represented the managers who received stable data (1), data for the same value and frame in both Parts 2 and 3, and managers who received unstable data (0), data of the opposite value in Parts 2 and 3. This variable was referred to as Stable. These two variables and their interaction (Value X Stable) were included as the independent variables in this analysis with the two main effects being entered into the equation first.

The dependent variable in the test of H4 was the opposing decision frame score (OppDFS) at the end of Part 3. Within this study opportunity and threat decision frames were considered to be opposing decision frames, as were strength and weakness. OppDFS was defined and operationalized here just as it was for H2 and H3. However, instead of using the decision frame scores at the end of Part 2, which were already used with H2 and H3, the decision frame scores for Part 3 were used in the analysis of H4. Furthermore, as with H2 and H3, internal and external decision frame scores were again grouped, since there were no hypothesized differences associated with internal or external frames of reference.

Three covariates were also included in the regression equation. These were similar to the covariates included in the analysis of H2 and H3, and included the managers' sample (Michigan=0 and U.S.=1), the frame manipulated in Part 3 (external=1 and internal=2), and the managers'

decision frame scores for the opposing decision frame at the end of Part 2 (PreDFS). The PreDFS for Part 2 was used as the pre-measure since the modified test of H4 was to examine the extent to which the managers further evoked the opposing decision frame when presented with stable outcomes. As originally planned, the test of H4 would have used the managers' decision frame scores at the end of Part 1 as the baseline. However, the original plan had also assumed that these managers would maintain their original frame of reference, which they did not.

Finally, only a small subsample of the overall sample of 180 managers was used in testing H4. First, as with H2 and H3, only those managers who received inconsistent data were considered. Next, of the 121 managers who received inconsistent data in Part 2, only the 40 managers who had initially received distinctive data in Part 1 and outcome data in Part 2 were included in the analysis, since H4 only applied to those managers.

H4 would be supported if there were a significant effect for the Value X Stable interaction and, given the coding scheme used here, the regression coefficient of Value X Stable should be positive. Such results would indicate that managers who received stable data (1) indicative of probable gains (+1) were more likely to evoke a positive frame of reference (i.e., opportunity or strength), than managers who received unstable data (0). No main effects were hypothesized for either independent variable.

Hypothesis Test. Prior to testing H4, the stability manipulation check was examined. At the end of Part 3, each manager had been asked to indicate the degree to which Clark's situation over the last two

years had been stable or unstable. The results for this manipulation check indicated that there were no significant differences between those managers who received stable outcomes and those managers who received unstable outcomes ($t=.67$, $p>.05$). Given the non-significant results for this subsample of managers ($n=40$), the manipulation check was also examined for the total sample of 180 managers as well as those 121 managers who received inconsistent data. Again, the results were non-significant and indicated that there were no differences in the stability ratings for the two groups. Finally, since the stability manipulation check item had been included at the end of the decision frame scales rather than as a separate question (see Appendix E), an analysis of covariance was used to determine if response biases might have affected the managers' ratings of this item. In this analysis, the dependent variable was the managers' stability ratings, the covariates were the managers' decision frame scores in Part 3, and the stability manipulation was the independent variable. While the results of this analysis also indicated that there were no differences in stability rating for the two groups, both covariates were significant at $p<.001$. Thus, the managers' ratings of stability may have been highly biased by their ratings for the decision frame scales. In addition, as will be demonstrated below, the managers did respond to the data manipulation in Part 3. These observations suggest that, while the stability rating for the two groups did not differ, the manipulation check itself may have been problematic and may not have accurately reflected the extent to which the manipulation was effective. Consequently, the analysis of H4 continued.

As shown in the first equation in Table 13, the covariates and independent variables accounted for 78% of the variance in the managers' opposing decision frame scores. However, there was no significant effect for the Stable X Value interaction once the covariates and main effects were removed. Thus, H4 was not supported. There were, however, significant effects for Frame, PreDFS, and Value, with the main effect for Value accounting for 30% of the variance in the managers' opposing decision frame scores at the end of Part 3. This main effect for Value demonstrated that the managers were responding to the experimental manipulation in Part 3.

Table 13

H4: Hierarchical Regressions for Opposing Decision Frame

Variable	Without Covariate DFS				With Covariate DFS			
	b	se	R ² Δ	R ²	b	se	R ² Δ	R ²
Sample	-.13	(.33)	.03	.03	.15	(.32)	.03	.03
Frame	-.54	(.37)	.23**	.27	-.38	(.35)	.23**	.27
PreDFS	.53	(.13)	.22***	.49	.54	(.12)	.22***	.49
CompDFS	--	--	--	--	.32	(.12)	.10**	.59
Value (A)	1.31	(.20)	.30***		1.28	(.19)	.22***	
Stable (B)	-.22	(.31)	.00	.80	-.13	(.28)	.00	.82
A X B	-.52	(.32)	.01	.81	-.78	(.31)	.03*	.85
Constant	.47	(.65)			.07	(.61)		
	F=23.63 df=6,33 p<.001				F=25.19 df=7,32 p<.001			
	R ² _{adj} =.78				R ² _{adj} =.81			

*** p<.001, ** p<.01, * p<.05

Note: Unstandardized regression coefficients are shown with standard errors in parentheses.

Sample: Managerial sample (Michigan=0 and U.S.=1).

Frame: Frame manipulated in Part 3 (external=1 and internal=2).

PreDFS: Decision frame score for OppDFS at end of Part 2.

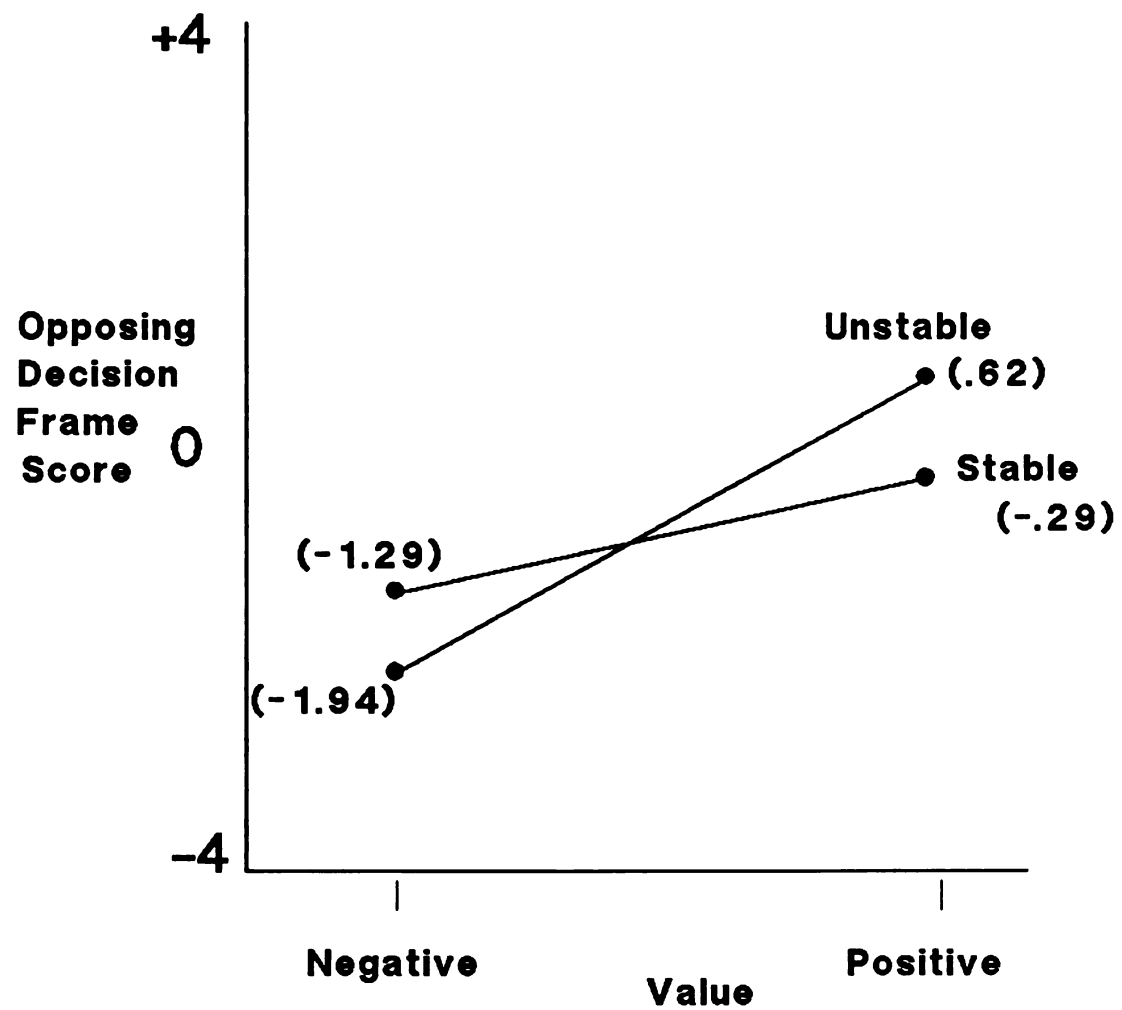
OppDFS: Managers' opposing decision frame scores (if DV=Internal-3, OppDFS=External-3; if DV=External-3, OppDFS=Internal-3).

Value: Value of attribute data in Part 3 (negative=-1 and positive=+1).

Stable: Stability of data in Part 3 -- stable (1) if data in Parts 2 and 3 were of same value and unstable (0) if they were of opposing values.

Given the high intercorrelation among the decision frame scales in Part 3 ($r=.43$, $p<.001$), this analysis was repeated with the managers' complementary decision frame (CompDFS) as an additional covariate. In this analysis, as with H2, the managers' complementary decision frame score was the decision frame score for the frame that was not manipulated in Part 3. As shown in the second equation, the interaction for Value X Stable in this case was significant ($R^2\Delta=.03$). However, the regression coefficient was negative as opposed to positive and indicated that the managers were more likely to evoke the opposing decision frames if the outcomes were unstable. Thus, H4 was not supported. Figure 14 shows a plot the Value X Stable interaction.

Figure 14
H4: Stability by Value Interaction
for Opposing Decision Frame



Supplemental Analysis. The supplemental analysis of H4, as with the earlier analyses, focused on the consequences of excluding Ext 4 from the external decision frame scales. Although there was a significant effect for Frame in the original analysis, given the relatively small subsample available, supplemental analyses were not completed for internal and external frames of reference.

These results with Ext 4 excluded from the external decision frame scales were analogous to the original results. Specifically, there were still significant main effects for Frame, PreDFS, CompDFS, and Value. In addition, the interaction for Value X Stable was still significant when CompDFS was included as a covariate and the regression coefficient was still negative. Thus, H4 was still not supported.

Conclusion. Since the managers readily evoked the opposing decision frames in response to the inconsistent data presented in Part 2, the assumption upon which H4 was based did not exist. Thus, the test of H4 focused on whether stable outcomes were likely to have an additional effect on the extent to which the managers evoked the opposing decision frame, over and above that observed in H2. The results of that analysis, however, showed that stable outcomes had the opposite effect suggested by H4. Namely, if the outcomes were stable the managers were less likely to evoke the opposing decision frames, than if the outcomes were unstable. So, if the managers had initially received distinctive opportunity data in Part 1, and threat outcome data in Parts 2 and 3 (i.e., stable), they were less likely to evoke a threat decision frame than managers who had initially received threat data Part

1 which was followed by opportunity outcomes in Part 2 and threat outcomes in Part 3 (i.e., unstable).

One possible explanation for these counter-intuitive results might be that the managers who received unstable outcomes in Part 3 escalated their ratings in Part 3 because they always received data which were inconsistent with their evoked frame of reference. On the other hand the managers who received stable outcome data may not have changed their ratings since they had already evoked the decision frame reflected by the outcomes in Part 2.

Hypothesis 5 Results

H5: The decision frame the decision maker evokes in a given situation will be related to the decision maker's corporate-level strategy recommendations.

H5 proposed that the managers' frames of reference at the end of the scenario would affect the extent to which the managers would recommend eleven different corporate-level strategies. However, no specific predictions were made concerning the types of strategies they might recommend given different frames of reference. The hypothesis only suggested that the extent to which the managers evoked opportunity/threat and strength/weakness decision frames would influence their corporate strategy recommendations. The eleven corporate strategies were product development, market development, concentric diversification, divestment, retrenchment, liquidation, forward integration, conglomerate diversification, backward integration, concentration, and horizontal integration.

Analytic Procedures. As described previously, the managers had been asked at the end of the scenario the extent to which they would recommend eleven different corporate level strategies given their overall impression of Clark's situation. The strategy recommendations could take on values of 1 to 5, with five indicating a highly recommended strategy. The ratings for each of these eleven strategies served as the dependent variables in the analysis of H5.

Since H5 involved multiple dependent variables, it was initially tested using canonical analysis. In the canonical analysis, the Y variate consisted of the eleven corporate-level strategy ratings and the

X variate was composed of the managers' internal (Internal-3) and external (External-3) decision frame scores at the end of Part 3. Given a significant multivariate effect, multiple regressions were then calculated for the eleven strategies. The regression analyses were used to determine whether the managers' frame of reference was related to each of the eleven strategies and to identify the pattern of those relationships. H5 would be supported if there was a significant multivariate effect for the canonical analysis.

Hypothesis Test. Using the managers' ratings for the eleven corporate strategies as the Y variate and the managers' decision frame scores as the X variate, there was a significant multivariate effect ($F=5.05$, $df=22,320$, $p<.001$) with two significant canonical correlations of $R_{c1}=.60$ ($p<.001$) and $R_{c2}=.33$ ($p<.05$). The average squared canonical correlation for these two variates was $R^2_c=.24$ (Cramer & Nicewinder, 1979). Redundancy coefficients (R^2_{dy}) were calculated for each canonical variate and summed to provide an overall estimate of the variance explained in the dependent variable set by the independent variable set (Cohen & Cohen, 1983; Cooley & Lohnes, 1971; Stewart & Love, 1968). The overall variance explained by the two canonical variates was $R^2_{dy}=.06$.

Given this significant multivariate effect, individual regressions equations were computed for each of the eleven corporate-level strategies. In each equation the corporate-level strategy was regressed on the two decision frame scores (External-3 and Internal-3) and their two-way interaction with all variables entered simultaneously. Table 16 shows the unstandardized regression coefficients, standard errors, and F

test for each corporate-level strategy with the significant regression coefficients in brackets. The eleven strategies are grouped according by the four generic corporate strategies that were identified earlier.

Table 14

H5: Regression Analysis for Corporate-level Strategies

Corporate-level Strategy	<u>External-3</u>		<u>Internal-3</u>		<u>A X B</u>		F
	b	se	b	se	b	se	
Product development	[-.13 .06]		.06 .05		.01 .02		1.71
Market development	-.12 .07		.09 .05		-.05 .03		1.63
Concentric diversification	.02 .08		[.12 .06]		.00 .03		2.85*
Divestment	[-.22 .07]		-.06 .06		.03 .03		8.34***
Retrenchment	[-.30 .07]		-.05 .05		-.01 .03		11.58***
Liquidation	[-.14 .06]		.02 .05		.03 .02		3.36*
Forward integration	-.14 .08		[.16 .06]		-.01 .03		2.47
Conglomerate diversification	-.05 .08		[.13 .06]		-.03 .03		1.79
Backward integration	.02 .07		.05 .06		.02 .03		.80
Concentration	[.29 .08]		-.04 .06		.05 .03		5.88***
Horizontal integration	.06 .07		.10 .06		-.02 .03		2.75*

*** p<.001, ** p<.01, * p<.05

Note: Unstandardized regression coefficients are shown with standard errors. Brackets indicate significant regression coefficients.

External-3: External decision frame score at the end of Part 3.

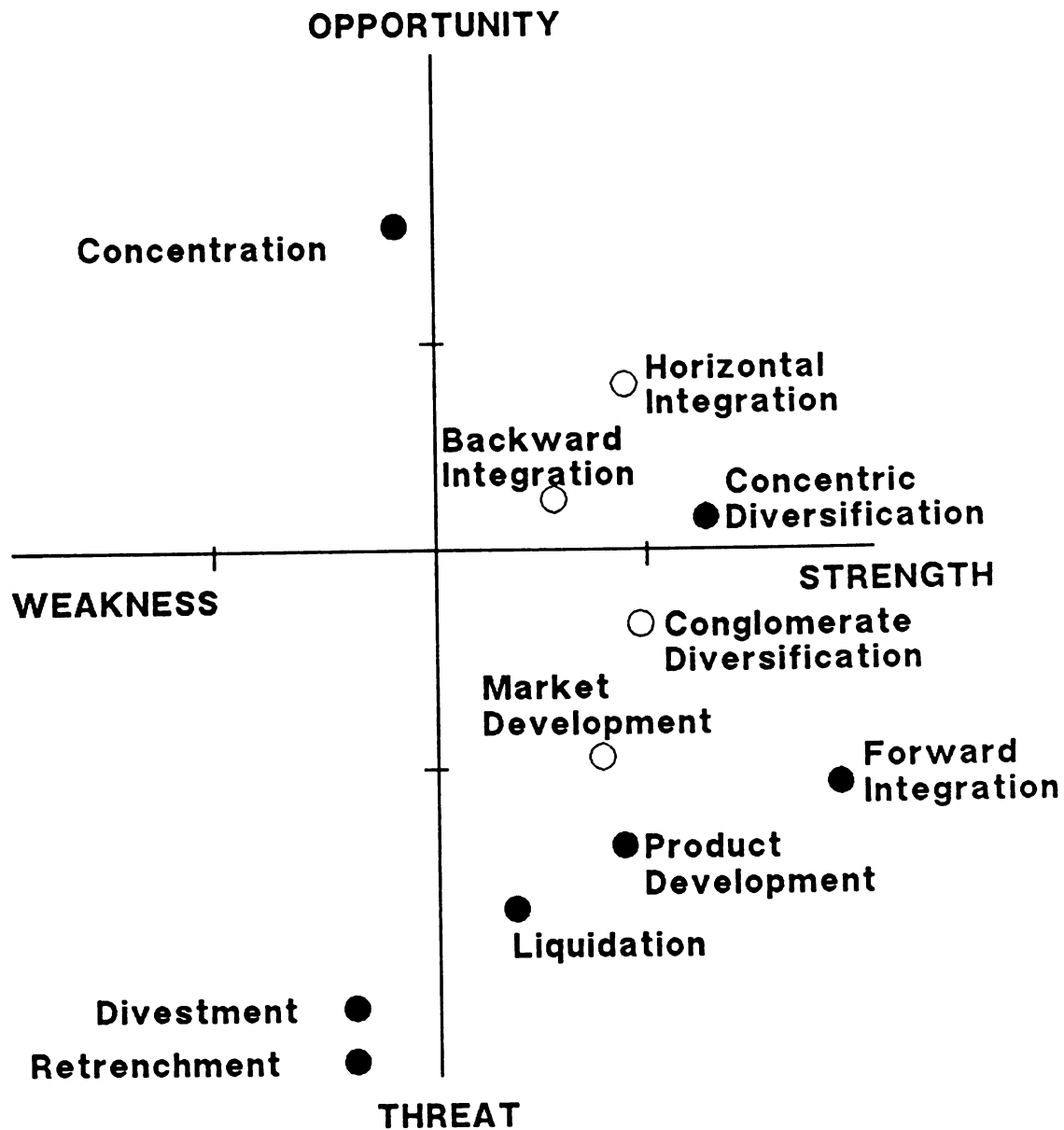
Internal-3: Internal decision frame score at the end of Part 3.

As shown in Table 14, the managers' recommendations for six of the eleven corporate-level strategies were influenced by the frame of reference they evoked. Specifically, managers who evoked a threat frame of reference tended to recommend retrenchment ($R^2=.17$), divestment ($R^2=.15$), and liquidation ($R^2=.06$) strategies. On the other hand, managers who evoked an opportunity decision frame recommended a concentration strategy ($R^2=.09$). The only diversification strategy associated with the managers' decision frame scores was concentric diversification ($R^2=.05$) which they recommended when they evoked a strength decision frame. Finally, the extent to which the managers evoked a weakness decision frame was not positively associated with any of the corporate-level strategies. Thus, it seems that their corporate strategy recommendations were primarily driven by their perceptions of external opportunities and threats, and internal strengths.

Figure 15 graphically summarizes the relationships between the managers' frames of reference and their strategy recommendations. The placement of the strategies on the matrix was based on the standardized regression coefficients for the two decision frame scales for each strategy. For example, the standardized regression coefficient for the retrenchment strategy were $-.35$ (Exttot-3) and $-.09$ (Inttot-3) and the retrenchment strategy was situated along each axis accordingly. For purposes of this presentation, the standardized regression coefficients used to pinpoint each strategy were calculated without the interaction term. In the figure significant regression coefficients ($p<.05$) are located beyond the hash mark on the relevant axis. For example, the Exttot-3 regression coefficient for the retrenchment strategy

(beta=-.35, $p<.001$) is beyond the hash mark at the threat end of the vertical axis, but inside the hash mark on the horizontal axis (Inttot-3: beta=-.09, $p>.05$). The position of each strategy can best be interpreted as the degree to which the strategy is positively related to each of the four decision frames, and the extent to which managers who evoked a particular frame of reference recommended the strategy.

Figure 15
H5: Decision Frames and Corporate-Level
Strategy Recommendations



- Significant beta for one decision frame
- Non-significant beta for both decision frames

Note: Hash mark indicates $p < .05$.

Supplemental Analysis. The supplemental analysis for H5 focused on two issues. First, the analysis was repeated with the factor scores for the four strategy factors as the dependent variables. Second, the canonical analysis was repeated with Ext 4 excluded from the external decision frame scale.

The managers' ratings for the eleven corporate strategies, as described earlier, were factor analyzed and four underlying factors were identified: related-diversification (RDS), withdrawal (WS), unrelated-diversification (UDS), and concentration (CS). The factor scores for each of these generic corporate strategies were then used as the dependent variables in this supplemental analysis. The managers' decision frame scores (Internal-3 and External-3) and their interaction were again used as the independent variables.

Using the four identified generic strategy factors as the Y variate and the managers' decision frame scores as the X variate, there was again a significant multivariate effect ($F=10.92$, $df=8,334$, $p<.001$). Two significant canonical variates were identified in the analysis with canonical correlations of $R_{c1}=.57$ and $R_{c2}=.22$. Given this multivariate effect, individual regression equations were calculated for each of the generic corporate-level strategies. Those regression equations are shown in Table 15.

Table 15

**H5: Evoked Decision Frame and Recommended
Generic Corporate-level Strategies**

Variable	Generic Corporate-level Strategy			
	RDS	WS	UDS	CS
External-3 (A)	-.13* (.06)	-.27*** (.06)	-.02 (.06)	.19** (.06)
Internal-3 (B)	.08 (.05)	-.03 (.05)	.13** (.05)	.02 (.05)
A X B	-.02 (.03)	.01 (.02)	.00 (.03)	.03 (.03)
Constant	.10 (.10)	.08 (.09)	.03 (.09)	-.12 (.09)
F	1.47	13.99***	3.51*	6.28***
df	3,170	3,170	3,170	3,170
R ²	.03	.20	.06	.10

*** p<.001, ** p<.01, * p<.05

Note: Unstandardized regression coefficients are shown with standard errors in parentheses.

RDS: Related-diversification strategy factor

WS: Withdrawal strategy factor

UDS: Unrelated-diversification strategy factor

CS: Concentration strategy factor

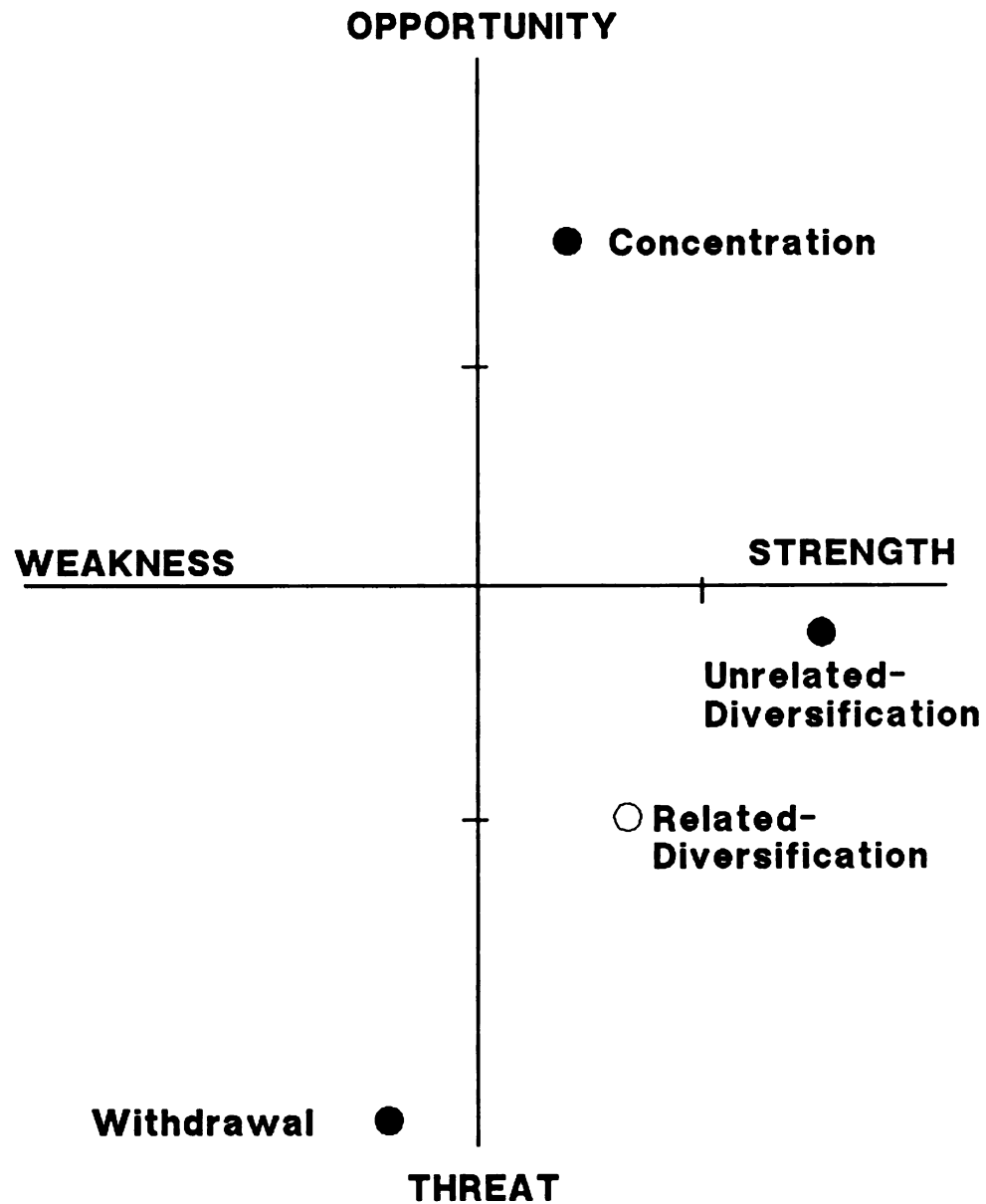
External-3: External decision frame score at the end of Part 3.

Internal-3: Internal decision frame score at the end of Part 3.

As with the original analysis, the managers' frame of reference was most strongly associated with their recommendations concerning the withdrawal ($R^2=.20$) and concentration ($R^2=.10$) strategies. In addition, their evoked frame of reference was associated with their recommendations for the unrelated-diversification strategy ($R^2=.06$), but was not associated with their recommendations regarding the related-diversification strategy. Specifically, if the managers had evoked a threat decision frame they were likely to recommend a withdrawal strategy and if they evoked an opportunity decision frame they tended to recommend a concentration strategy. In addition, those managers that evoked a strength decision frame were more likely to recommend an unrelated-diversification strategy. Again, the extent to which the managers evoked a weakness frame of reference was not positively associated with their recommendations concerning any of the four generic corporate-level strategies.

Figure 16 provides a graphic summary of the relationships between the managers' evoked frame of reference and their recommendations concerning the four generic corporate-level strategies. As before, each generic strategy was plotted using the standardized regression coefficients for the Exttot-3 and Inttot-3 scale with significant regression coefficients being located outside the hash mark on the respective axes.

Figure 16
H5: Decision Frame and Generic Corporate-Level
Strategy Recommendations



- Significant beta for one decision frame
- Non-significant beta for both decision frames

Note: Hash mark indicates $p < .05$.

Finally, the original canonical analysis, with the eleven corporate strategies, was repeated but with Ext 4 excluded from External-3. The results for that analysis were similar in most respects to the results for the original analysis. There was still a multivariate effect ($F=4.56$, $df=22,320$, $p<.001$) with two canonical correlations of comparable magnitude: $R_{c1}=.59$ ($p<.001$) and $R_{c2}=.30$ ($p<.10$).

Conclusion. H5 was supported. There was clear consistent evidence that the frames of reference the managers evoked influenced their strategy recommendations. A threat decision frame was positively related to withdrawal strategies including retrenchment, divestment, and liquidation strategies, while an opportunity frame was positively associated with concentration strategies including horizontal integration. In addition, a strength decision frame was positively related to recommendations for an unrelated-diversification strategy and a concentric diversification strategy. Finally, these results suggest that managers' recommendations concerning corporate-level strategies may be driven primarily by their perceptions of opportunities, threats, and strengths, since perceptions of weaknesses were not positively associated with their recommendations to adopt any of these strategies.

Hypothesis 6 Results

H6: The relationship between the attribute data presented and the decision maker's choice of corporate-level strategy will be non-significant when controlling for the decision maker's evoked decision frame.

The intent of H6 was to determine whether the managers' decision frame was a cognitive structure which mediated the relationship between the data presented in the scenario and their strategy recommendations. In other words, was it the managers' interpretation of the data that determined their strategy recommendations, or did the data have a separate independent effect on their recommendations?

As proposed, this hypothesis predicted full mediation (James & Brett, 1984). That is, there were to be no effects for the attribute data on the managers' strategy recommendations beyond that associated with the managers' frames of reference. To demonstrate full mediation it was necessary to show (a) that the managers' decision frame scores were associated with their strategy recommendations, (b) that the attribute data were associated with the managers' decision frame scores, (c) that the attribute data were associated with the strategy recommendations, and (d) that the association between the attribute data and the strategy recommendations was not significant when controlling for the managers' decision frame scores (Baron & Kenny, 1986).

Analytic Procedures. Since H6 involved multiple dependent variables, multiple mediators, and multiple independent variables, a series of four canonical analyses was required to evaluate this hypothesis. In these analyses the dependent variable was the managers' strategy factor scores. These factor scores, as described earlier,

generated four generic corporate-level strategies including related-diversification, withdrawal, unrelated-diversification, and concentration. The factor scores for these generic strategies were used rather than the ratings for the original eleven strategies so as to maintain an acceptable subject-to-variable ratio (20:1) and conserve statistical power (Cohen & Cohen, 1983; Stevens, 1986).

The mediating variables in these analyses were the managers' internal (Internal-3) and external (External-3) decision frame scores at the end of Part 3.

Finally, the independent variables in the analyses were the attribute data presented in Part 3. The attribute data were dummy coded along the two dimensions which defined the four decision frames used in this study. First, the frame of reference represented by the data (Frame) was coded so that managers who received strength or weakness data were coded "+1" and managers who received opportunity or threat data were coded "-1". This coding paralleled the internal versus external dimension which defined the four decision frames. Second, managers who received attribute data in Part 3 suggesting losses were coded "-1" and managers who received data suggesting gains were coded "+1". This variable was referred to as Value and was analogous to the Value variable used in the earlier analyses. In addition to these two main effects, the interaction between these contrasts was also included in the analyses (i.e., Value X Frame).

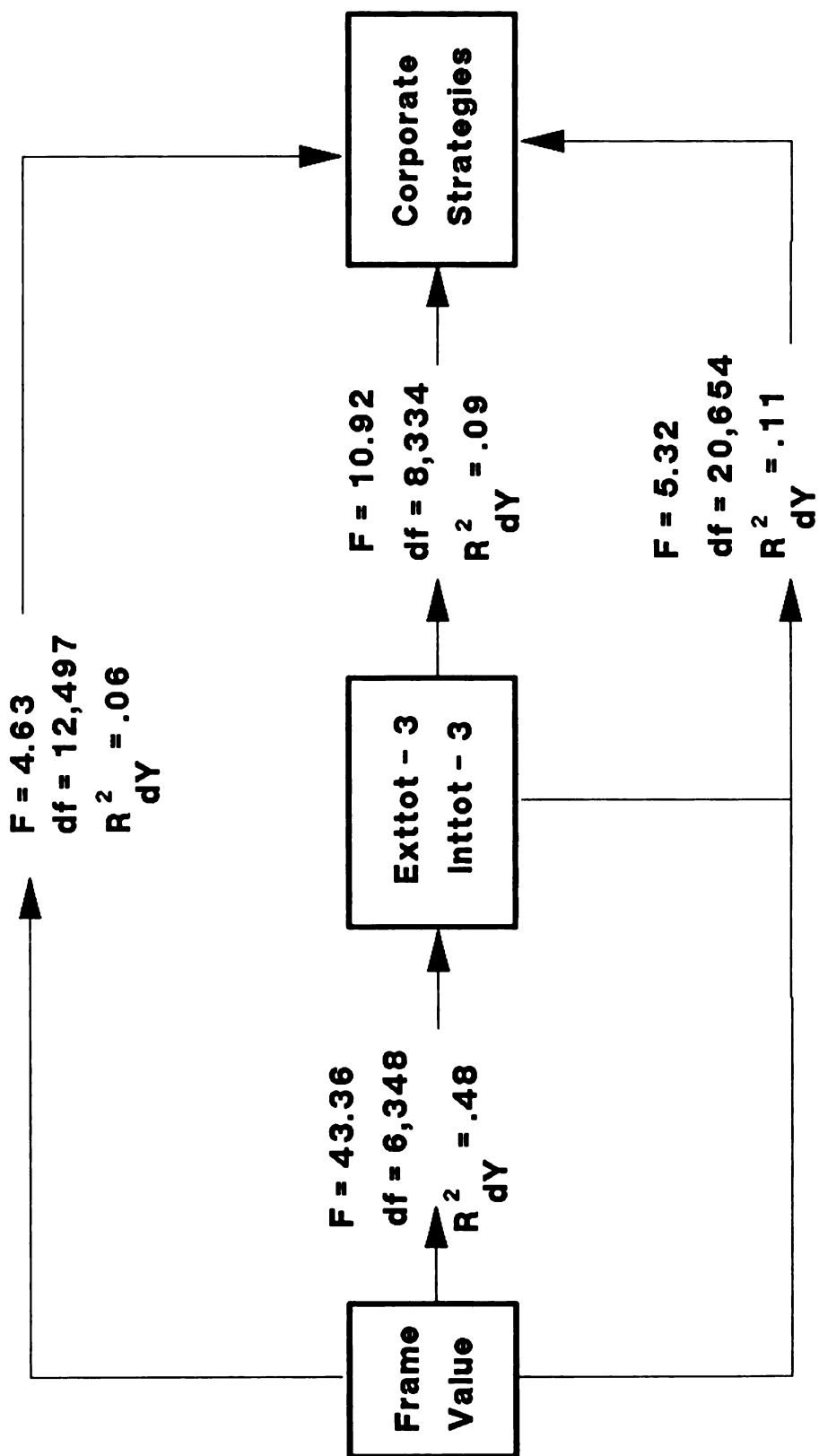
The four canonical analyses used to test H6 examined the following relationship:

- (a) Frame, Value, Value X Frame $\rightarrow$ Strategy Factor Scores;
- (b) Frame, Value, Value X Frame $\rightarrow$ Exttot-3, Inttot-3;
- (c) Exttot-3, Inttot-3 $\rightarrow$ Strategy Factor Scores; and
- (d) Frame, Value, Frame X Value, Exttot-3, Inttot-3 $\rightarrow$
Strategy Factor Scores.

H6 would be supported if each of the first three canonical analyses showed significant multivariate effects and if the difference in explained variance between equations (c) and (d) was not significant.

Hypothesis Test. Figure 17 summarizes the results of these four canonical analyses. Included in the figure are the significance tests and the redundancy coefficients (R^2_{dy}) for each equation. In equation (a), there was a significant multivariate effect ($F=4.63$, $df=12,497$, $p<.001$) for the independent variables on the four strategy factors with a redundancy coefficient of $R^2_{dy}=.06$. In equation (b), there was a significant multivariate effect ($F=43.36$, $df=6,348$, $p<.001$) for the independent variables on the managers' decision frame scores with $R^2_{dy}=.48$. In equation (c) the managers' decision frame scores (Exttot-3, Inttot-3), the mediating variables, were used to predict the four strategy factors. Again, there was a significant multivariate effect ($F=10.92$, $df=8,334$, $p<.001$) with $R^2_{dy}=.09$.

Figure 17
H6: Multivariate Mediation Test



Next, the variance explained by equation (d) was compared with the variance explained by equation (c) using an incremental F test (Cohen & Cohen, 1983). This F test was not significant (R^2_{dy} , $F=1.26$ $df=3,168$ $p>.05$). Thus, no additional variance in the strategy factors was explained by inclusion of the independent variables beyond that already explained by the managers' decision frame scores. Consequently, it was concluded that the managers' frame of reference was a mediating variable between the data the managers received and their corporate strategies recommendations.

Finally, a second incremental F-test was calculated using equations (a) and (d) in order to determine whether the managers' frame of reference might explain additional variance in the managers' strategy recommendations beyond that which could be attributed to the data presented in Part 3. The results of that F-test were significant ($F=4.72$, $df=2,168$, $p<.05$). Thus, not only did the managers' frame of reference intervene between the data and their recommendations, the frame they evoked had an independent effect on their strategy recommendations.

Supplemental Analysis. The supplemental analysis of H6 focused on two issues. First, given the above multivariate effects, individual regressions were calculated using each of the strategy factors as the dependent variable. This analysis would show whether the above results held for each of the four generic strategies. Second, as with all the earlier analyses, the original analysis was repeated with Ext 4 excluded from the external decision frame scale (External-3).

The first supplemental analysis of H6 involved a series of regression equations using the strategy factors as the dependent variables. As with the original analysis, the independent variables were the dummy coded experimental manipulations in Part 3 of the scenario (Frame, Value) and their two-way interaction. The mediating variables in these analyses were the managers' decision frame scores from Part 3 (Internal-3 and External-3) and their two-way interaction.

The first set of regression equations was used to determine whether the managers' decision frame scores were related to their strategy recommendations and whether the independent variables explained any additional variance in those recommendations. The dependent variables in these equations were the four strategy factors. In this analysis, the two decision frame scores (Internal-3 and External-3) and their interaction were entered simultaneously into each equation. Next, the residual variance in the dependent variables was regressed on the independent variables which were entered simultaneously into each equation. If the managers' frame of reference was an intervening variable then the decision frame scores should be related to managers' recommendations concerning each generic strategy and there should be no significant effects for the scenario data beyond that already explained by the managers' frame of reference. Specifically, the $R^2\Delta$ for the decision frame scores should be significant and the $R^2\Delta$ for the independent variable set should be non-significant once the variance associated with the managers' decision frame scores has been removed.

Table 16 shows the results of each of these regression equations for each of the four strategy factors. The top of the table shows the

regression results when only the decision frame scores were entered into the equation, while the bottom of the table shows the consequences of adding the independent variables to the equation. The regression coefficients and standard errors are also shown.

As shown in Table 16, the managers' decision frame scores influenced their recommendations concerning withdrawal strategies, concentration strategies, and unrelated-diversification strategies. However, the managers' frame of reference did not influence their recommendations concerning related-diversification strategies, nor did the independent variables explain the degree to which the managers would recommend related-diversification strategies. Thus, the managers' frame of reference could not mediate their recommendations concerning related diversification strategies. In addition, the inclusion of the independent variables did not increase the explained variance significantly for any of these generic strategies, once the effects for the managers' decision frame scores were removed.

Table 16

H6: Hierarchical Regression Mediation Tests

Variable	Generic Corporate-level Strategy			
	RDS	WS	UDS	CS
<u>Mediating Variables</u>				
External-3 (A)	-.09 (.08)	-.22** (.07)	.00 (.08)	.12 (.08)
Internal-3 (B)	.15* (.07)	-.01 (.06)	.18** (.06)	.10 (.06)
A X B	-.02 (.03)	.02 (.03)	.00 (.03)	.01 (.03)
F (3,170)	1.47	13.99***	3.51*	6.28***
R ² Δ	.03	.20	.06	.10
<u>Exogenous Variables</u>				
Frame (C)	-.01 (.08) [-.09]	.07 (.08) [.10]	.08 (.08) [-.02]	.16* (.08) [.09]
Value (D)	-.22* (.11) [-.16*]	-.14 (.10) [-.35***]	-.11 (.11) [.08]	.03 (.10) [.26**]
C X D	-.14 (.09) [-.04]	.03 (.08) [.05]	-.03 (.09) [.07]	-.13 (.08) [-.09]
Constant	.08 (.10) [-.01]	.05 (.09) [-.02]	.02 (.10) [.01]	-.05 (.10) [.01]
F (6,167)	1.90	7.53***	2.07	4.17***
R ² Δ	.04	.01	.01	.03
R ²	.06	.21	.07	.13
F (3,170)	[2.06]	[9.22***]	[.70]	[5.01**]
R ²	[.04]	[.14]	[.01]	[.08]

*** p<.001, ** p<.01, * p<.05

Note: Unstandardized regression coefficients are shown with standard errors in parentheses. Brackets values show results with generic strategies regressed on exogenous variables.

RDS: Related-diversification strategy factor; WS: Withdrawal strategy factor; UDS: Unrelated-diversification strategy factor; CS: Concentration strategy factor.

External-3: External decision frame score at the end of Part 3.

Internal-3: Internal decision frame score at the end of Part 3.

Frame: Frame manipulated in Part 2 (external=-1 and internal=+1).

Value: Value of attribute data (negative=-1 and positive=+1).

Next, the strategy factors were regressed on the independent variables (Frame, Value, Value X Frame). This analysis was necessary in order to demonstrate that the attribute data were influencing the strategy recommendations through the frames of reference the managers had evoked. The results of these regressions are presented in brackets in Table 16. In the case of the withdrawal strategies ($F=9.22$, $df=3,170$, $p<.001$) and concentration strategies ($F=5.01$, $df=3,170$, $p<.01$) there were significant effects for the independent variables. However, the managers' recommendations concerning the related and unrelated-diversification strategies were not associated with the data presented in the scenario.

Finally, it was necessary to demonstrate that the attribute data in Part 3 of the scenario were related to the managers' decision frame scores. Thus, in these analyses the managers' Internal-3 and External-3 frame scores were used as the dependent variables, while Frame, Value, and Value X Frame were the independent variables. In both equations, the independent variables were significantly related to the managers' decision frame scores. When Exttot-3 was the dependent variable 43% of the variance in the managers' decision frame was due to the attribute data presented in Part 3 ($F=45.05$, $df=3,176$, $p<.001$). When Inttot-3 was the dependent variable 52% of the variance was accounted for by the attribute data ($F=62.45$, $df=3,176$, $p<.001$).

In summary, the managers' frames of reference did fully mediate their recommendations concerning withdrawal and concentration strategies, but not their recommendations concerning related or unrelated diversification strategies. Neither the attribute data nor

the managers' frames of reference were related to their recommendations concerning related-diversification strategies. Their recommendations concerning unrelated-diversification strategies were influenced by the managers' frames of reference, but were independent of the attribute data the managers had received in Part 3.

Next, the original analysis, involving the four canonical analyses was repeated with Ext 4 excluded for the managers' external decision frame scale (External-3). The results of these analyses were analogous with the original results. Specifically, there were still significant multivariate effects for the first three equations (a, b, and c) and there were no significant differences in the explained variance when the attribute data were included in equation (d) beyond that already explained by the managers' frames of reference.

Conclusion. H6, as stated, was supported. As shown in the original analysis, the managers' frames of reference did fully mediate the relationship between the data presented in the scenario and the managers' strategy recommendations. In addition, there was evidence that the managers' frames of reference actually had an independent effect on the managers' strategy recommendations beyond that associated with the data presented in Part 3.

The supplemental analysis provided additional insights into these results. First, it showed that this mediating relationship held for withdrawal and concentration strategies, but not for related- and unrelated-diversification strategies. Second, it demonstrated that the independent effects of the managers' frames of reference were primarily associated with their recommendations concerning the related- and

unrelated-diversification strategies. In some respects, the lack of mediation and independent effects of the managers' frames of reference on these two diversification strategies might be expected given the design of this study. In particular, the managers in this study only received attribute data for one decision frame in each scenario part and the data that were presented in each scenario part reflected either gains or losses, but not both. Thus, the manipulations within this study did not present conditions where managers were presented with a mix of distinctive internal and external sources of gains and losses; the precise conditions which may be most strongly associated with related- and unrelated-diversification strategies.

Chapter 6

Discussion

The intent of this study was to identify those factors that lead managers to frame and reframe strategic decisions one way rather than another, and to examine the impact of strategic decision framing processes on managers' choices of corporate-level strategies. This chapter reviews the findings of the study, discusses the limitations and contributions of the study, and suggests implications the findings have for future research into strategic decision framing.

Summary of Findings

Framing. The framing hypothesis predicted that when the managers received distinctive data they would evoke the decision frame associated with those data and when the managers received equivocal data they would evoke the chronically accessible decision frame. As demonstrated here the availability of distinctive data did play an important role in the activation of the alternative decision frames. When provided with data distinctive of an opportunity the managers evoked an opportunity decision frame, and when presented with data distinctive of a threat they evoked a threat decision frame. When presented with data distinctive of strengths the managers evoked a strength decision frame, and when presented with data distinctive of weakness, they evoked a weakness decision frame.

Furthermore, of the two dimensions along which these four decision frames were defined, the value of the attribute data and whether it suggested probable gains or losses was more potent than was the source

or locus of those probable gains or losses. Thus, when given data suggesting losses, whether due to internal or external sources, the managers tended to evoke a generally negative frame of reference; when given data suggesting gains, whether due to internal or external sources, they tended to evoke a generally positive frame of reference.

Finally, chronic accessibility of internal or external frames of reference did not have the hypothesized effect on initial framing processes. Specifically, there was no evidence that managers given equivocal data were more likely to evoke the more accessible decision frame.

Reframing. The reframing hypotheses (H2 and H3) predicted that when presented with supplemental inconsistent outcome data the managers who had initially received equivocal data would reframe the original data by evoking a frame of reference that fit not only the supplemental inconsistent data but also fit the original data. If the supplemental inconsistent data had been indicative of predictors, or if the original data had been distinctive, the managers were supposed to maintain their original frame of reference.

While the higher-order interaction predicted by the reframing hypotheses was not supported, there was evidence that the equivocality of the original data, the principal variable in the framework presented here, did influence the extent to which the managers reframed the situation. In particular, managers who received initially equivocal data evoked a decision frame which fit the supplemental inconsistent data they received and, more importantly, they also evoked a decision frame which fit the original data. For example, managers who had evoked

an opportunity decision frame in response to equivocal data suggesting gains evoked strength and threat decision frames when they were later presented with threat data. While the threat frame fit the supplemental inconsistent threat data, the strength frame fit the original equivocal data and, thus, showed that the managers had reinterpreted those original data. The fact that these managers evoked a decision frame congruent with the original data provided the strongest evidence that the managers had actually reframed the situation and, more importantly, provided support for the underlying conceptual framework.

While there was no evidence that the predictor-outcome distinction suggested here had any effect on reframing, it did appear that the presence of outcome data was more evocative of a decision frame than was the presence of predictor data. Specifically, in the case of opportunity and threat decision frames the managers were more likely to evoke a frame of reference which fit the inconsistent data if the inconsistent data were reflective of outcomes as opposed to predictors. However, since the presentation of inconsistent outcome data did not affect the degree to which the managers evoked a decision frame which fit the original data, these results do not demonstrate that outcome attributes have a greater impact on reframing than do predictor attributes. They do suggest, however, that managers may be more likely to evoke a particular decision frame when outcome data are present than when predictor data are present.

There was also an effect observed for the predictor-outcome distinction in the case of strength and weakness decision frames, but of the opposite direction. That is, predictor attributes appeared to have

a greater impact than outcome attributes on the extent to which the managers evoked a decision frame which fit the supplemental inconsistent data. While this observation suggests that predictor and outcome data may have a differential impact across different frames of reference, these contrasting findings may actually have been due to unforeseen variations in the predictor-outcome manipulation. Problems involving the predictor-outcome manipulation in the case of strength/weakness decision frames will be discussed later as a limitation of this study.

Although the reframing hypotheses had predicted that the managers would only change their frames of reference when the initial data were equivocal and the supplemental data were reflective of outcomes, the managers in this study readily changed their perspectives when presented with any inconsistent data. If they had originally evoked a threat decision frame, they did not hesitate to evoke an opportunity decision frame when presented with supplemental data distinctive of an opportunity. Furthermore, they also evoked a strength decision frame, which again indicated that the value of the attribute data and whether it suggested gains or losses had the most profound impact on the decision frame the managers adopted.

Finally, since the managers had readily evoked a new frame of reference which fit the inconsistent data, it was not possible to test the first-order cognitive change hypothesis (H4). Specifically, this hypothesis had predicted that the managers who had initially received distinctive data or supplemental predictor data would only change their frame of reference when they received stable outcome data. However, the incremental effects of stable or unstable outcome data were examined.

Contrary to the relationship suggested here, these results indicated that unstable outcome data rather than stable outcome data affected the extent to which the managers evoked a decision frame which fit the inconsistent data. When presented with stable outcome data over multiple observations the managers were less likely to evoke the decision frame associated with the stable data than if the outcome data were unstable. One explanation for these counter-intuitive results may be that the managers who received unstable data adopted more extreme interpretations because of the greater contrasts presented by their scenarios. That is, the managers in the unstable condition received data which indicated that the firm's situation was constantly changing, while managers in the stable condition were presented with data suggesting only a single change in the firm's situation.

Choice of Corporate-level Strategy. As predicted (H5), the managers' frames of reference did influence their recommended corporate-level strategies. Managers who evoked a threat decision frame recommended withdrawal strategies including retrenchment, divestiture, and liquidation, while managers who framed the situation as one presenting opportunities recommended concentration strategies including horizontal integration. Only one of the related-diversification strategies was significantly associated with the managers' frames of reference. In particular, managers who evoked a strength decision frame would recommend a concentric diversification strategy. The managers also recommended a generic unrelated-diversification strategy in situations evocative of a strength frame of reference.

Furthermore, these results indicated that the managers' recommendations to adopt a specific corporate strategy or one of the four generic strategies were primarily driven by their perceptions of external opportunities and threats, and internal strengths. They were not likely to recommend any of the corporate-level strategies if they perceived internal weaknesses. While speculative, the absence of a positive association between a weakness decision frame and the corporate strategy recommendations suggests that managers who perceive weaknesses may become absorbed by these weaknesses and feel the firm is incapable of taking the actions necessary to implement any corporate strategies including even a withdrawal strategy.

Finally, as predicted (H6), the managers' evoked frame of reference was an intervening variable between the data they received and the corporate-level strategies they recommended. This was particularly true for withdrawal and concentration strategies. Furthermore, the managers' evoked frame of reference had an impact beyond that associated with the data they had received. Thus, the decision frame the managers evoked had an independent effect on their recommended corporate strategies.

Limitations of Study

As with all empirical research, the implementation of this research involved many choices and trade-offs to accomplish the study's objectives. At this point, these trade-offs constitute limitations on the current findings. These limitations, however, also represent opportunities for future research examining strategic decision framing.

Perhaps the overriding limitation to this study was its reliance on a hypothetical scenario to test each hypothesis. While the scenario and experimental manipulations used here eliminated many extraneous confounds and enhanced the internal validity of this study, this methodology also generated threats to the external validity of these findings. Of particular concern is the extent to which these results represent the actual decision making processes and strategic choices these managers would make if they encountered the situation described in the scenario. Would these managers, when making strategic decisions concerning their own firms, respond in the same way to the same attribute data? Moreover, would these managers change their frames of reference as readily as they did in this study? While cases, scenarios, and simulations (e.g., Fredrickson, 1985; Jackson & Dutton, 1987; Moch, Buchko, & Rubin, 1988; Walsh, 1988) have been used elsewhere to examine strategic decision making processes, the results of this study as well as those studies are limited in their generalizability until tested and demonstrated in the field in an actual strategic decision making context.

The results of this study are also limited by definition to the sample of managers and auto-supplier firms examined here. The external validity of these findings, however, was promoted through the use of a sample of managers involved in strategic decision making. Furthermore, given the diverse technologies and products manufactured by these firms, the results reported may be representative of similar managers in a wider population of manufacturing firms.

Other limitations of the study are associated with the manipulations, measures, and experimental procedures used in the study. First, distinctive and equivocal attributes were only identified from a negative frame of reference. It was assumed within this study that a given attribute when assigned opposite values was equally distinctive of the opposing frames. For example, if the presence of more aggressive competitors would evoke a threat frame, it was assumed that the presence of less aggressive competitors would evoke an opportunity frame. While there was a significant effect for the value of the data, it was not possible to determine the extent to which these effects might also be reflective of differences in the distinctiveness of positively versus negatively valued attributes.

Second, the criteria used to identify outcomes representing each of the decision frames had to be relaxed in order to generate a sufficient number of distinctive outcomes for use in the scenario. Consequently, it was not possible to test the reframing hypothesis as planned and may not be possible unless additional distinctive outcomes can be identified. Furthermore, the delineation of outcome and predictor attributes may itself be problematic. That is, some of the identified predictor attributes are the consequences of other predictor attributes and, therefore, may be more indicative of an outcome than are other predictor attributes. For example, the predictor attribute "buyer demand for a firm's product" could also be thought of as an outcome of "buyer satisfaction with the firm's product" which was considered to be a predictor attribute. In some respects, the attributes used here form a hierarchical chain of causal relationships

and whether an attribute is a predictor or an outcome may depend on one's relative position in that means-end chain. Furthermore, it is not possible to determine whether the managers themselves distinguished predictor from outcome attributes, since no manipulation check was used for this predictor-outcome manipulation.

Third, the fact that decision frame accessibility was not associated with the managers' evoked decision frame when equivocal data were presented suggests that either the concept as operationalized here was ineffective, or the construct itself is irrelevant to decision framing processes. At this point, given the previously untested accessibility measure used here and the extensive social-psychological research demonstrating the effects of accessibility under a variety of conditions, the first alternative seems more reasonable. One potential difficulty with the accessibility measure used here is that it may have artificially forced the managers' chronic frames of reference into one of two alternatives, internal or external, rather than letting the specific frames of reference emerge as part of the free recall task. In the future, for those interested in investigating the effects of chronically accessible decision frames, it may be advisable that they develop a measure more analogous to those used in social-psychological research (Bargh et al., 1986; Srull & Wyer, 1979, 1980) where multiple constructs or frames of reference, are generated and their effects evaluated. The research questions and design of this study would not have allowed that option.

Fourth, while the reliability and factor structure of the Internal Decision Frame scale exceeded expectations, the External Decision Frame

scale was somewhat problematic. In particular, the external scale had only marginal reliabilities, and in one of the three factor analyses one of the scale items (Ext 4) loaded on the internal scale. While the lower reliability of the external scale certainly attenuated the findings involving this scale, its effects were generally inconsequential. Specifically, all of the hypothesis tests and most of the supplemental analyses were similar for both scales and remained unchanged when the problematic item (Ext 4) was excluded from the External Decision Frame Scale.

Fifth, as stated above, it was not possible to fully test the first-order cognitive change hypothesis (H4) since the managers had already evoked the opposing decision frame. Thus, the effect of the stable or unstable data on first-order change processes could not be evaluated. Furthermore, while the stability manipulation did appear to affect the managers' responses, the manipulation check did not indicate that the managers were distinguishing between stable and unstable conditions. The managers' responses to this manipulation check suggested two potential problems with the stability-instability manipulation. First, the stable-unstable may not have been adequate for eliciting perceptions of stability or instability, since the managers were only provided with three data points upon which to base those judgments. Second, placing the stability manipulation check at the end of the decision frame scales may have biased the managers' ratings of stability and made it impossible to determine whether the manipulation worked. Consequently, future research investigating the effects of stability on decision framing processes should consider providing

multiple data points to insure a more potent manipulation and the use of a separate manipulation check in order to avoid the above problems.

Finally, the design of the experiment created conditions in which each manager received data from only one frame of reference. Specifically, the study did not present conditions in which managers were presented with distinctive opportunity and weakness attributes in a single scenario, or distinctive threat and strength attributes. In part, this may explain why the effects for the related- and unrelated-diversification strategies were considerably smaller than the effects observed for the withdrawal and concentration strategies, since perceptions of strengths/threats and weaknesses/opportunities may be most conducive to these diversification strategies. That is, managers may choose an unrelated-diversification strategy when they perceive strengths and threats, since unrelated diversification represents one way to avoid external threats when the firm has internal strengths. Alternatively, managers might choose a related-diversification strategy since related diversification represents one way of correcting internal weaknesses while capitalizing on external opportunities.

Contributions of Study

This study has made six theoretical and one methodological contribution to the field of strategic decision making. Each of these contributions and its implications for future research efforts are presented below.

Framing Processes and Strategic Decisions. This study has demonstrated that those factors that lead managers to evoke a particular frame of reference also influence their strategic decisions. Prior to

this study, researchers had either focused on the processes which influence the frame of reference managers adopt (Jackson & Dutton, 1988), or the consequences of alternative frames of reference on managers' strategic choices (Fredrickson, 1985; Meyer, 1982). In effect, this study has linked the underlying processes with their impact on strategic decision making. Thus, in the future, researchers examining decision framing processes can proceed with confidence that those processes do, in fact, influence important strategic decisions.

Furthermore, the effects of these processes have been demonstrated with a sample of top and middle-level managers experienced in making strategic decisions. The findings of prior research (Fredrickson, 1985) had suggested the possibility that strategic choices of an experienced manager may be unaffected by the manager's frame of reference. The findings of this study, however, have shown that the experienced strategic decision maker's frame of reference does affect, at least, his or her choice of corporate-level strategy, and suggest that other strategic decisions at the corporate or business level may also be affected by the decision frames considered here.

Positive and Negative Frames of Reference. This study has also demonstrated the substantive impact positive and negative frames of reference can have in decision framing studies. As reported here, the value of the attribute data and whether it suggests probable gains or losses was consistently the best predictor of the managers' evoked decision frames irrespective of the source of those gains or losses. Given these findings, researchers in the future will have to pay greater attention to the construct validity of the decision frames they study,

especially if those decision frames include a positive/negative or gain/loss dimension.

Past studies of decision framing, unfortunately, have focused almost exclusively on decision frames which differed primarily in terms of this positive/negative dimension (e.g., opportunity/threat). By comparison, this study examined multiple decision frames with multiple dimensions simultaneously (i.e., opportunity/threat and strength/weakness). Consequently, the construct validity of the conceptual definitions and decision frame scales used here was enhanced. Moreover, it was possible to show that the four decision frames were distinct constructs and not simply reflections of Tversky and Kahneman's (1981) positive and negative decision frames.

Finally, although the results of this as well as earlier research would indicate that positive and negative frames of reference play the predominant role in the framing of managerial decisions, this study also suggests that decision makers can adopt a variety of perspectives on the given situation. In particular, it suggests that managers can view their firms' strategic problems from either an internal or an external vantage point -- from the "inside out" or from the "outside in". While not abandoning positive and negative decision frames, researchers should consider exploring these and other perspectives that may impact managerial decision making.

Stimulus Equivocality and Decision Frame Accessibility. As mentioned in the introduction to this study, strategic problems are by definition ambiguous (Mintzberg et al., 1976) and one source of this ambiguity is the equivocal stimuli strategic decision makers encounter.

In this regard, a third contribution of this study has been the development of a theoretical framework for operationalizing stimulus equivocality. Stimulus equivocality was described here as the presence of data which fit common variable slots in overlapping cognitive structures. The findings of this study, in addition, have provided preliminary empirical evidence supporting this theoretical framework and the effects of these overlapping cognitive structures.

This study, however, was inconsequential in identifying specific factors that would predict the frame of reference managers would adopt when presented with equivocal stimuli. Specifically, chronic decision frame accessibility as operationalized did not influence the managers' frame of reference when equivocal data were present. While decision frame accessibility did not play a role in this study, other operational measures and manipulations will have to be developed and tested before its potential impact can be ruled out. In examining the role of decision frame accessibility researchers should also explore other frames of reference which may prove more efficacious than the internal/external dimension considered here. In particular, examining the accessibility of positive and negative frames of reference might prove profitable given the substantive effect observed here. In any case, the initial research question concerning the frame of reference strategic decision makers are likely to adopt when faced with equivocal stimuli is still important but remains unanswered.

Distinctive Attributes and Decision Framing. The effects of the distinctive attribute information observed in this study were very similar to those found by Jackson and Dutton (1988). There was,

however, one very important difference in this study. Specifically, the types of attributes identified and used in this study were quite different from the types of attributes identified and used in Jackson and Dutton (1988). In particular, the attributes used here were conceptualized as variable slots within variable networks which could take on different values. For example, "costs of raw materials" could be either "rising" or "falling". The attributes identified and used by Jackson and Dutton, on the other hand, were more suggestive of "social cues" or "primes". For example, they described opportunities as "positive" with a "high probability of resolution" and "there was much to gain, but little to lose".

In spite of the evident differences in these two sets of attributes, both sets appeared to evoke the same frames of reference. One possible explanation for this apparent anomaly is that the differences in the attributes used in these studies are simply reflective of different hierarchical levels in the vertical structure of these decision frames. If, as suggested earlier, decision frames are cognitive structures, then they are likely to have a vertical structure. If this is the case, then the attributes identified and used in this study seem to be more reflective of lower level schemata, which may be embedded within or lead to the activation of the attributes identified by Jackson and Dutton (1988). For example, "rising raw material costs" might lead the manager to evoke "negative" and "loss" interpretations which might then lead to the activation of threat or weakness decision frames. From this perspective then it might be possible to integrate these two sets of attributes and examine the differential effects the

hierarchical level of the attributes have on strategic decision framing processes and outcomes.

Cognitive Change and Reframing. While cognitive change has been a topic of considerable research in the organizational sciences, the unique properties of different types of cognitive change have often been overlooked or blurred. Thus, another contribution of this study is that it has brought into focus reframing as a distinct type of cognitive change. Specifically, reframing was described here as a second-order cognitive change process which was not dependent on other exogenous changes.

In addition, this study has provided initial empirical evidence demonstrating reframing effects. In particular, the managers in this study, under some experimental conditions, evoked frames of reference which indicated that they were actually reinterpreting the initial data they had received. While the reframing effects observed here were marginal in magnitude, they do suggest that reframing does occur and that it is a unique type of cognitive change.

Finally, reframing merits further attention, since it proposes a different process by which managers can come to evoke new interpretations of "old" situations. In the past, researchers have focused attention extensively on first-order cognitive change, second-order cognitive change triggered by exogenous changes, or learning as mechanisms by which managers evoke new interpretations of "old" situations. The results reported here suggest another alternative and one that is not dependent on other exogenous changes.

Generic Corporate-level Strategies. The final theoretical contribution of this study has been the identification of four generic corporate-level strategies. Specifically, an exploratory factor analysis of the eleven corporate strategies included in this study generated four corporate-level strategy factors. These strategy factors were subsequently defined as withdrawal, concentration, related-diversification, and unrelated-diversification strategies. While the factor structure of these generic strategies was relatively clean and suggested that the four generic strategies were distinct, the analysis presented here was exploratory. Consequently, these results can only be considered tentative until replicated with another sample of managers.

Decision Frame Scales. In the past, researchers studying decision frames and their effects have all too often relied on single item measures which may be highly unreliable in spite of their apparent face validity. Thus, a methodological contribution of this study has been the development of two multi-item scales for measuring opportunity/threat and strength/weakness decision frames. As shown here the decision frame scales used in this study were reliable and generally had the expected factor structure. Of the two scales, the strength/weakness decision frame scale was somewhat superior to the scale used to measure opportunity/threat decision frames. In addition, there was some evidence supporting the construct validity of the two scales.

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APPENDICES

APPENDIX A

External Attribute Rating Survey

Auto-Supplier Survey:

Strategic Problems and Consequences

Auto suppliers face a number of different types of strategic problems which are likely to affect their firm's performance as well as the performance of the industry. The purpose of this survey is to identify auto-suppliers' perceptions concerning the causes and consequences of different types of strategic problems. Besides providing valuable information, completing the questionnaire should be beneficial in stimulating your own thinking regarding the strategic problems your firm may be experiencing and their potential causes and consequences.

The questionnaire is being distributed to a select sample of managers in auto-supplier firms. Participation in this study is voluntary, although it is hoped that each manager that receives a questionnaire will complete and return it.

The questionnaire consists of three parts and should take approximately 20 minutes to complete. Please answer all questions. While there are no right or wrong answers, it is important that you carefully read the instructions and questions so that your answers accurately reflect your opinions.

Responses to the survey are strictly confidential and will only be reported in aggregate form. Summary results of the study will be made available to participating firms after the study is completed.

Please return the completed questionnaire in the enclosed stamped self-addressed envelope within the next week. If you have any questions, concerns, or comments regarding the study, please contact:

Dr. James Skivington or
Richard Z. Gooding
Department of Management
(517) 353-5415

Your participation in this study is greatly appreciated.

PART 1: Strategic Problems

Listed below are a number of strategic problems auto suppliers are currently experiencing. Some of the problems might be classified as external problems associated with threats in the organization's environment.

Please read each statement carefully. Then indicate the extent to which the statement fits with your image of an externally caused problem. Use the following rating scale and circle your response.

- 5 - fits my image of an external problem very well
- 4 - fits my image of an external problem well
- 3 - fits my image of an external problem somewhat
- 2 - fits my image of an external problem very little
- 1 - does not fit my image of an external problem at all

- | | | | | | | |
|-----|---|---|---|---|---|---|
| 1. | New suppliers for the firm's raw material are not being located. | 1 | 2 | 3 | 4 | 5 |
| 2. | The firm's working capital is declining. | 1 | 2 | 3 | 4 | 5 |
| 3. | International markets are being closed for possible export of the firm's product. | 1 | 2 | 3 | 4 | 5 |
| 4. | The firm's plant and equipment are becoming increasingly obsolete. | 1 | 2 | 3 | 4 | 5 |
| 5. | Buyers are becoming less dependent on the firm's product. | 1 | 2 | 3 | 4 | 5 |
| 6. | The firm is not attracting and retaining highly competent employees. | 1 | 2 | 3 | 4 | 5 |
| 7. | Fewer buyer groups are expressing interest in the firm's product. | 1 | 2 | 3 | 4 | 5 |
| 8. | Buyer demand for the firm's product is decreasing. | 1 | 2 | 3 | 4 | 5 |
| 9. | Buyer satisfaction with the firm's product is deteriorating. | 1 | 2 | 3 | 4 | 5 |
| 10. | Attempts in other industries to develop substitutes for the product are meeting with success. | 1 | 2 | 3 | 4 | 5 |
| 11. | The relative price of substitute products is beginning to decline. | 1 | 2 | 3 | 4 | 5 |
| 12. | The costs of the firm's raw materials are increasing. | 1 | 2 | 3 | 4 | 5 |

- 5 - fits my image of an external problem very well
 4 - fits my image of an external problem well
 3 - fits my image of an external problem somewhat
 2 - fits my image of an external problem very little
 1 - does not fit my image of an external problem at all

- | | | | | | | |
|-----|--|---|---|---|---|---|
| 13. | Employees in the firm's R&D department are having problems in developing successful product innovations. | 1 | 2 | 3 | 4 | 5 |
| 14. | Foreign competitors are entering the market. | 1 | 2 | 3 | 4 | 5 |
| 15. | Competitors are successfully introducing more efficient production technologies. | 1 | 2 | 3 | 4 | 5 |
| 16. | Suppliers to the firm are becoming less reliable in their delivery raw materials. | 1 | 2 | 3 | 4 | 5 |
| 17. | The firm is not building larger plants to improve operating efficiency. | 1 | 2 | 3 | 4 | 5 |
| 18. | The firm's product is not being modified to provide more technologically superior features. | 1 | 2 | 3 | 4 | 5 |
| 19. | Competitors are becoming more aggressive in their pricing practices. | 1 | 2 | 3 | 4 | 5 |
| 20. | The firm is losing its access to raw material suppliers. | 1 | 2 | 3 | 4 | 5 |
| 21. | The firm is not successfully adapting to recent changes in production technology. | 1 | 2 | 3 | 4 | 5 |
| 22. | New facilities of the firm are being located farther from the firm's primary buyers. | 1 | 2 | 3 | 4 | 5 |
| 23. | The annual R&D investment of the firm is decreasing. | 1 | 2 | 3 | 4 | 5 |
| 24. | Employee morale at the firm is declining. | 1 | 2 | 3 | 4 | 5 |
| 25. | The firm is relying on fewer suppliers for its raw materials. | 1 | 2 | 3 | 4 | 5 |
| 26. | Competitors' production processes are becoming more efficient. | 1 | 2 | 3 | 4 | 5 |
| 27. | Competitors are using more aggressive promotional activities. | 1 | 2 | 3 | 4 | 5 |
| 28. | The management of the firm is becoming less effective in responding to operational needs. | 1 | 2 | 3 | 4 | 5 |

- 5 - fits my image of an external problem very well
 4 - fits my image of an external problem well
 3 - fits my image of an external problem somewhat
 2 - fits my image of an external problem very little
 1 - does not fit my image of an external problem at all

- | | | | | | | |
|-----|---|---|---|---|---|---|
| 29. | Surplus capital resources are no longer available to the firm. | 1 | 2 | 3 | 4 | 5 |
| 30. | The relative quality and performance of substitute products is improving. | 1 | 2 | 3 | 4 | 5 |
| 31. | The firm's strategic direction is increasingly unclear. | 1 | 2 | 3 | 4 | 5 |
| 32. | Buyers are less willing to pay a premium price for the firm's product. | 1 | 2 | 3 | 4 | 5 |
| 33. | The firm is losing its position as the acknowledged market leader. | 1 | 2 | 3 | 4 | 5 |
| 34. | A number of new firms are entering the market. | 1 | 2 | 3 | 4 | 5 |
| 35. | Buyers of the firm's product are beginning to rely on more suppliers. | 1 | 2 | 3 | 4 | 5 |
| 36. | There is decreasing buyer interest in the product. | 1 | 2 | 3 | 4 | 5 |
| 37. | The superiority of the firm's product is becoming less evident. | 1 | 2 | 3 | 4 | 5 |
| 38. | Shifts in the population are decreasing demand for the firm's product. | 1 | 2 | 3 | 4 | 5 |
| 39. | Buyer loyalty to the firm's product is decreasing. | 1 | 2 | 3 | 4 | 5 |
| 40. | The firm is becoming less effective at monitoring and controlling production costs. | 1 | 2 | 3 | 4 | 5 |

PART II: Outcome Ratings

Listed below are a number of possible firm and industry-level outcomes. Some of these outcomes may occur when environmental threats are present while others may not. Consider each outcome carefully. Then circle the rating that best indicates the likelihood that the outcome will occur when the firm's environment presents external threats. Please use the following scale.

- 5 - very likely the outcome will occur
- 4 - likely the outcome will occur
- 3 - somewhat likely the outcome will occur
- 2 - unlikely the outcome will occur
- 1 - very unlikely the outcome will occur

- | | | | | | | |
|-----|---|---|---|---|---|---|
| 1. | The firm's profit margins will be below the industry average. | 1 | 2 | 3 | 4 | 5 |
| 2. | Competitors' sales will increase. | 1 | 2 | 3 | 4 | 5 |
| 3. | Industry-wide sales will decrease. | 1 | 2 | 3 | 4 | 5 |
| 4. | The firm's sales will deteriorate. | 1 | 2 | 3 | 4 | 5 |
| 5. | The firm's inventory levels will rise. | 1 | 2 | 3 | 4 | 5 |
| 6. | The industry will become less efficient. | 1 | 2 | 3 | 4 | 5 |
| 7. | The firm's competitive position in the market will deteriorate. | 1 | 2 | 3 | 4 | 5 |
| 8. | Industry profit margins will narrow. | 1 | 2 | 3 | 4 | 5 |
| 9. | The firm's market share will decrease. | 1 | 2 | 3 | 4 | 5 |
| 10. | The firm's productivity will fall. | 1 | 2 | 3 | 4 | 5 |
| 11. | The industry growth rate will decline. | 1 | 2 | 3 | 4 | 5 |
| 12. | The firm's profit margins will narrow. | 1 | 2 | 3 | 4 | 5 |
| 13. | Less efficient firms will leave the industry. | 1 | 2 | 3 | 4 | 5 |
| 14. | The firm's growth rate will be below the industry average. | 1 | 2 | 3 | 4 | 5 |
| 15. | Industry-wide production capacity will decrease. | 1 | 2 | 3 | 4 | 5 |
| 16. | Competitor's profit margins will improve. | 1 | 2 | 3 | 4 | 5 |

Background Information

Please complete the following concerning your current position and past work experience.

1. What is your current job title? _____
2. Which of the following represents the primary functional area of your current position? (CHECK ONLY ONE)
 - _____ Procurement/purchasing
 - _____ Production/operations
 - _____ Marketing/sales
 - _____ Personnel
 - _____ Finance/accounting
 - _____ General administration
 - _____ Engineering/R&D
 - _____ Other
3. How many years have you worked in this functional area? _____
4. How many years have you been in this position? _____
5. How many years have you been with your current firm? _____
6. How many years have you been employed in auto-supplier firms? _____
7. Which one of the following best represents your educational status? (CHECK ONLY ONE)
 - _____ high school graduate
 - _____ some college but no degree
 - _____ undergraduate degree, business major
 - _____ undergraduate degree, non-business major
 - _____ graduate degree, business major
 - _____ graduate degree, non-business major
8. Are you a member of the top policy and planning committee in your organization? _____ yes _____ no
9. How many people are members of the top policy and planning committee of your firm? _____
10. Would the CEO of your firm consider you to be an... (CHECK ONLY ONE)
 - _____ executive level manager
 - _____ top level manager
 - _____ middle level manager
 - _____ lower level manager
 - _____ nonmanagement employee

THANK YOU FOR YOUR PARTICIPATION IN THIS STUDY.

APPENDIX B

Internal Attribute Rating Survey

Auto-Supplier Survey:

Strategic Problems and Consequences

Auto suppliers face a number of different types of strategic problems which are likely to affect their firm's performance as well as the performance of the industry. The purpose of this survey is to identify auto-suppliers' perceptions concerning the causes and consequences of different types of strategic problems. Besides providing valuable information, completing the questionnaire should be beneficial in stimulating your own thinking regarding the strategic problems your firm may be experiencing and their potential causes and consequences.

The questionnaire is being distributed to a select sample of managers in auto-supplier firms. Participation in this study is voluntary, although it is hoped that each manager that receives a questionnaire will complete and return it.

The questionnaire consists of three parts and should take approximately 20 minutes to complete. Please answer all questions. While there are no right or wrong answers, it is important that you carefully read the instructions and questions so that your answers accurately reflect your opinions.

Responses to the survey are strictly confidential and will only be reported in aggregate form. Summary results of the study will be made available to participating firms after the study is completed.

Please return the completed questionnaire in the enclosed stamped self-addressed envelope within the next week. If you have any questions, concerns, or comments regarding the study, please contact:

Dr. James Skivington or
Richard Z. Gooding
Department of Management
(517) 353-5415

Your participation in this study is greatly appreciated.

ID _____

PART 1: Strategic Problems

Listed below are a number of strategic problems auto suppliers are currently experiencing. Some of the problems might be classified as internal problems associated with weaknesses within the organization itself.

Please read each statement carefully. Then indicate the extent to which the statement fits with your image of an internally caused problem. Use the following rating scale and circle your response.

- 5 - fits my image of an internal problem very well
- 4 - fits my image of an internal problem well
- 3 - fits my image of an internal problem somewhat
- 2 - fits my image of an internal problem very little
- 1 - does not fit my image of an internal problem at all

- | | | | | | | |
|-----|---|---|---|---|---|---|
| 1. | New suppliers for the firm's raw material are not being located. | 1 | 2 | 3 | 4 | 5 |
| 2. | The firm's working capital is declining. | 1 | 2 | 3 | 4 | 5 |
| 3. | International markets are being closed for possible export of the firm's product. | 1 | 2 | 3 | 4 | 5 |
| 4. | The firm's plant and equipment are becoming increasingly obsolete. | 1 | 2 | 3 | 4 | 5 |
| 5. | Buyers are becoming less dependent on the firm's product. | 1 | 2 | 3 | 4 | 5 |
| 6. | The firm is not attracting and retaining highly competent employees. | 1 | 2 | 3 | 4 | 5 |
| 7. | Fewer buyer groups are expressing interest in the firm's product. | 1 | 2 | 3 | 4 | 5 |
| 8. | Buyer demand for the firm's product is decreasing. | 1 | 2 | 3 | 4 | 5 |
| 9. | Buyer satisfaction with the firm's product is deteriorating. | 1 | 2 | 3 | 4 | 5 |
| 10. | Attempts in other industries to develop substitutes for the product are meeting with success. | 1 | 2 | 3 | 4 | 5 |
| 11. | The relative price of substitute products is beginning to decline. | 1 | 2 | 3 | 4 | 5 |
| 12. | The costs of the firm's raw materials are increasing. | 1 | 2 | 3 | 4 | 5 |

- 5 - fits my image of an internal problem very well
 4 - fits my image of an internal problem well
 3 - fits my image of an internal problem somewhat
 2 - fits my image of an internal problem very little
 1 - does not fit my image of an internal problem at all

- | | | | | | | |
|-----|--|---|---|---|---|---|
| 13. | Employees in the firm's R&D department are having problems in developing successful product innovations. | 1 | 2 | 3 | 4 | 5 |
| 14. | Foreign competitors are entering the market. | 1 | 2 | 3 | 4 | 5 |
| 15. | Competitors are successfully introducing more efficient production technologies. | 1 | 2 | 3 | 4 | 5 |
| 16. | Suppliers to the firm are becoming less reliable in their delivery raw materials. | 1 | 2 | 3 | 4 | 5 |
| 17. | The firm is not building larger plants to improve operating efficiency. | 1 | 2 | 3 | 4 | 5 |
| 18. | The firm's product is not being modified to provide more technologically superior features. | 1 | 2 | 3 | 4 | 5 |
| 19. | Competitors are becoming more aggressive in their pricing practices. | 1 | 2 | 3 | 4 | 5 |
| 20. | The firm is losing its access to raw material suppliers. | 1 | 2 | 3 | 4 | 5 |
| 21. | The firm is not successfully adapting to recent changes in production technology. | 1 | 2 | 3 | 4 | 5 |
| 22. | New facilities of the firm are being located farther from the firm's primary buyers. | 1 | 2 | 3 | 4 | 5 |
| 23. | The annual R&D investment of the firm is decreasing. | 1 | 2 | 3 | 4 | 5 |
| 24. | Employee morale at the firm is declining. | 1 | 2 | 3 | 4 | 5 |
| 25. | The firm is relying on fewer suppliers for its raw materials. | 1 | 2 | 3 | 4 | 5 |
| 26. | Competitors' production processes are becoming more efficient. | 1 | 2 | 3 | 4 | 5 |
| 27. | Competitors are using more aggressive promotional activities. | 1 | 2 | 3 | 4 | 5 |
| 28. | The management of the firm is becoming less effective in responding to operational needs. | 1 | 2 | 3 | 4 | 5 |

- 5 - fits my image of an internal problem very well
- 4 - fits my image of an internal problem well
- 3 - fits my image of an internal problem somewhat
- 2 - fits my image of an internal problem very little
- 1 - does not fit my image of an internal problem at all

- | | | |
|-----|---|-------------------|
| 29. | Surplus capital resources are no longer available to the firm. | 1 2 3 4 5 |
| 30. | The relative quality and performance of substitute products is improving. | 1 2 3 4 5 |
| 31. | The firm's strategic direction is increasingly unclear. | 1 2 3 4 5 |
| 32. | Buyers are less willing to pay a premium price for the firm's product. | 1 2 3 4 5 |
| 33. | The firm is losing its position as the acknowledged market leader. | 1 2 3 4 5 |
| 34. | A number of new firms are entering the market. | 1 2 3 4 5 |
| 35. | Buyers of the firm's product are beginning to rely on more suppliers. | 1 2 3 4 5 |
| 36. | There is decreasing buyer interest in the product. | 1 2 3 4 5 |
| 37. | The superiority of the firm's product is becoming less evident. | 1 2 3 4 5 |
| 38. | Shifts in the population are decreasing demand for the firm's product. | 1 2 3 4 5 |
| 39. | Buyer loyalty to the firm's product is decreasing. | 1 2 3 4 5 |
| 40. | The firm is becoming less effective at monitoring and controlling production costs. | 1 2 3 4 5 |

PART II: Outcome Ratings

Listed below are a number of possible firm- and industry-level outcomes. Some of these outcomes may occur when organizational weaknesses are present while others may not. Consider each outcome carefully. Then circle the rating that best indicates the likelihood that the outcome will occur when an auto-supplier has internal weaknesses. Please use the following scale.

- 5 = very likely the outcome will occur
 4 = likely the outcome will occur
 3 = somewhat likely the outcome will occur
 2 = unlikely the outcome will occur
 1 = very unlikely the outcome will occur

- | | | | | | | |
|-----|---|---|---|---|---|---|
| 1. | The firm's profit margins will be below the industry average. | 1 | 2 | 3 | 4 | 5 |
| 2. | Competitors' sales will increase. | 1 | 2 | 3 | 4 | 5 |
| 3. | Industry-wide sales will decrease. | 1 | 2 | 3 | 4 | 5 |
| 4. | The firm's sales will deteriorate. | 1 | 2 | 3 | 4 | 5 |
| 5. | The firm's inventory levels will rise. | 1 | 2 | 3 | 4 | 5 |
| 6. | The industry will become less efficient. | 1 | 2 | 3 | 4 | 5 |
| 7. | The firm's competitive position in the market will deteriorate. | 1 | 2 | 3 | 4 | 5 |
| 8. | Industry profit margins will narrow. | 1 | 2 | 3 | 4 | 5 |
| 9. | The firm's market share will decrease. | 1 | 2 | 3 | 4 | 5 |
| 10. | The firm's productivity will fall. | 1 | 2 | 3 | 4 | 5 |
| 11. | The industry growth rate will decline. | 1 | 2 | 3 | 4 | 5 |
| 12. | The firm's profit margins will narrow. | 1 | 2 | 3 | 4 | 5 |
| 13. | Less efficient firms will leave the industry. | 1 | 2 | 3 | 4 | 5 |
| 14. | The firm's growth rate will be below the industry average. | 1 | 2 | 3 | 4 | 5 |
| 15. | Industry-wide production capacity will decrease. | 1 | 2 | 3 | 4 | 5 |
| 16. | Competitor's profit margins will improve. | 1 | 2 | 3 | 4 | 5 |

Background Information

Please complete the following concerning your current position and past work experience.

1. What is your current job title? _____
2. Which of the following represents the primary functional area of your current position? (CHECK ONLY ONE)
 - _____ Procurement/purchasing
 - _____ Production/operations
 - _____ Marketing/sales
 - _____ Personnel
 - _____ Finance/accounting
 - _____ General administration
 - _____ Engineering/R&D
 - _____ Other
3. How many years have you worked in this functional area? _____
4. How many years have you been in this position? _____
5. How many years have you been with your current firm? _____
6. How many years have you been employed in auto-supplier firms? _____
7. Which one of the following best represents your educational status? (CHECK ONLY ONE)
 - _____ high school graduate
 - _____ some college but no degree
 - _____ undergraduate degree, business major
 - _____ undergraduate degree, non-business major
 - _____ graduate degree, business major
 - _____ graduate degree, non-business major
8. Are you a member of the top policy and planning committee in your organization? _____ yes _____ no
9. How many people are members of the top policy and planning committee of your firm? _____
10. Would the CEO of your firm consider you to be an... (CHECK ONLY ONE)
 - _____ executive level manager
 - _____ top level manager
 - _____ middle level manager
 - _____ lower level manager
 - _____ nonmanagement employee

THANK YOU FOR YOUR PARTICIPATION IN THIS STUDY.

APPENDIX C

Table A-1

Demographic Characteristics of Samples

	Attribute Respondents (Michigan)	Scenario Respondents Michigan	US
<u>Title</u>			
President/CEO	6 (11.5)	22 (17.7)	23 (41.8)
General Manager	11 (21.2)	8 (6.5)	12 (21.8)
Executive VP	23 (44.2)	20 (16.1)	8 (14.5)
Vice President	12 (23.1)	28 (22.6)	8 (14.5)
Manager	0 (0.0)	46 (37.1)	4 (7.3)
<u>Function</u>			
Purchasing	12 (23.1)	17 (13.7)	0 (0.0)
Production	14 (26.9)	25 (20.2)	1 (1.9)
Marketing	3 (5.8)	8 (6.5)	8 (14.8)
Personnel	0 (0.0)	1 (0.8)	1 (1.9)
Finance	10 (19.2)	19 (15.3)	2 (3.8)
Administration	8 (15.4)	32 (25.8)	39 (72.2)
Engineering	0 (0.0)	2 (1.6)	0 (0.0)
Quality Control	5 (9.6)	20 (16.1)	1 (1.9)
Other	0 (0.0)	0 (0.0)	2 (3.8)
<u>Highest level of education</u>			
High school grad	2 (3.8)	4 (3.3)	1 (1.9)
Some college	11 (21.2)	25 (20.3)	5 (9.3)
Undergrad-business	16 (30.8)	37 (30.1)	10 (18.5)
Undergrad-other	7 (13.5)	23 (18.7)	12 (22.2)
Graduate-business	11 (21.2)	24 (19.5)	19 (35.2)
Graduate-other	5 (9.6)	10 (8.1)	7 (13.0)
<u>On top policy and planning committee?</u>			
Yes	40 (76.9)	99 (66.9)	49 (90.7)
No	12 (23.1)	25 (20.2)	5 (9.3)
<u>Level of management</u>			
Executive	20 (38.5)	71 (57.3)	43 (79.6)
Top management	19 (36.5)	32 (25.8)	6 (11.1)
Middle level	13 (25.0)	21 (16.9)	5 (9.3)

Table A-1 (cont'd.)

	Attribute Respondents (Michigan)	Scenario Respondents	
		Michigan	US
<u>Years in function</u>			
(mean)	12.42	12.43	11.63
(sd)	8.30	7.57	7.20
<u>Years in position</u>			
(mean)	6.08	5.53	7.04
(sd)	5.68	5.36	6.53
<u>Years in firm</u>			
(mean)	9.96	9.43	13.94
(sd)	7.74	9.39	10.64
<u>Years in industry</u>			
(mean)	15.26	14.81	16.89
(sd)	7.93	9.33	11.21

*** p<.001, ** p<.01, * p<.05

APPENDIX D

Decision Frame Accessibility Measure

ID _____

STRATEGIC FACTORS EFFECTING PERFORMANCE

A. The performance of auto-supplier firms can be influenced by a number of different factors. In the space provided below list those factors that you feel are likely to have a significant effect on your firm's performance in the next three years.

Please use complete sentences/statements and list as many factors as you can in the space provided.

[] 1. _____

[] 2. _____

[] 3. _____

[] 4. _____

[] 5. _____

B. Now we would like you to classify each of the factors you identified above into internal or external categories. If you feel the factor is internal place an "I" in the box to the left; if you feel the factor is primarily external place an "E" in the box. Internal factors are defined as characteristics you would associate with your firm while external factors are defined as characteristics you would associate with your firm's environment. Please classify each factor into one category.

APPENDIX E

ID _____

STRATEGY SCENARIO

The scenario which follows describes a hypothetical auto-supplier firm -- Clark Inc. The scenario consists of three parts and should take about 15 minutes to complete. At the end of each part you will be asked for your analysis of Clark's situation. In addition, you will be asked to make decisions regarding Clark's future strategic direction. You will be asked to make these decisions even though you may not have all the information you desire.

While there are no right or wrong answers, it is important that you carefully read the scenario before you answer the questions at the end of each part. This will help to insure that your responses accurately reflect your impressions.

Your responses are strictly confidential and will only be reported in aggregate form. Summary results of the study will be made available to participating firms after the study is completed.

Please return the completed scenario in the enclosed stamped self-addressed envelope within the next week. If you have any questions, concerns, or comments regarding the study, please contact:

Dr. James Skivington or
Richard Z. Gooding
Aaron Buchko
Department of Management
(517) 353-5415

Your participation in this study is greatly appreciated.

Clark Inc. Part 1

For 30 years Clark has made hydraulic lines for auto brake systems. About half of the firm's output is sold to the replacement market and half to auto manufactures (OEM's). The firm employs approximately 160 people and has annual sales of approximately \$17 million and total assets of \$8 million.

Interviews with top and middle-level managers at Clark have uncovered the following facts. First, the firm is attracting and retaining highly competent employees. Second, the management of the firm is becoming more effective in responding to operational needs. Third, the firm is successfully adapting to recent changes in production technology. Finally, buyer satisfaction with the firm's product is increasing.

Based on the information you have gathered thus far and assuming that Clark's situation does not change, please answer the following questions. For each item circle the response level that is most consistent with your overall impression. If you feel that no change will occur circle "0".

- | | | |
|--|--|--------------|
| 1. Clark's productivity will... | improve
+4 +3 +2 +1 0 -1 -2 -3 -4 | deteriorate |
| 2. Profit margins in the hydraulic line industry will... | improve
+4 +3 +2 +1 0 -1 -2 -3 -4 | deteriorate |
| 3. Clark's competitive position in the market will... | improve
+4 +3 +2 +1 0 -1 -2 -3 -4 | deteriorate |
| 4. Industry wide sales will... | increase
+4 +3 +2 +1 0 -1 -2 -3 -4 | decrease |
| 5. Clark's management is... | effective
+4 +3 +2 +1 0 -1 -2 -3 -4 | ineffective |
| 6. The hydraulic line industry is... | attractive
+4 +3 +2 +1 0 -1 -2 -3 -4 | unattractive |
| 7. Clark has a number of... | strengths
+4 +3 +2 +1 0 -1 -2 -3 -4 | weaknesses |
| 8. Clark's environment presents a number of... | opportunities
+4 +3 +2 +1 0 -1 -2 -3 -4 | threats |
| 9. My confidence in my ratings is... | high
+4 +3 +2 +1 0 -1 -2 -3 -4 | low |

2-020

Clark Inc. Part 2

Over the next week you gather some additional facts about Clark's situation. First, the firm's plant and equipment are becoming increasingly obsolete. Second, the firm is becoming less effective at monitoring and controlling costs. Finally, employees in the firm's R&D department are having problems developing successful product innovations.

Based on the information you have gathered in Parts 1 and 2, and assuming that Clark's situation does not change, please answer the following questions. For each item circle the response level that is most consistent with your overall impression. If you feel that no change will occur circle "0".

- | | | |
|--|---------------------------|--------------|
| 1. Clark's productivity will... | improve | deteriorate |
| | +4 +3 +2 +1 0 -1 -2 -3 -4 | |
| 2. Profit margins in the hydraulic line industry will... | improve | deteriorate |
| | +4 +3 +2 +1 0 -1 -2 -3 -4 | |
| 3. Clark's competitive position in the market will... | improve | deteriorate |
| | +4 +3 +2 +1 0 -1 -2 -3 -4 | |
| 4. Industry wide sales will... | increase | decrease |
| | +4 +3 +2 +1 0 -1 -2 -3 -4 | |
| 5. Clark's management is... | effective | ineffective |
| | +4 +3 +2 +1 0 -1 -2 -3 -4 | |
| 6. The hydraulic line industry is... | attractive | unattractive |
| | +4 +3 +2 +1 0 -1 -2 -3 -4 | |
| 7. Clark has a number of... | strengths | weaknesses |
| | +4 +3 +2 +1 0 -1 -2 -3 -4 | |
| 8. Clark's environment presents a number of... | opportunities | threats |
| | +4 +3 +2 +1 0 -1 -2 -3 -4 | |
| 9. The information in Parts 1 and 2 is... | consistent | inconsistent |
| | +4 +3 +2 +1 0 -1 -2 -3 -4 | |

Clark Inc. Part 3

Two years later you receive a report on Clark's situation. This report indicates that the firm's sales are improving. Second, the firm's market share is improving. Finally, the firm's inventory levels are falling.

Based on all the information you have gathered and assuming that Clark's situation does not change, please answer the following questions. For each item circle the response level that is most consistent with your overall impression. If you feel that no change will occur circle "0".

- | | | |
|--|--|--------------|
| 1. Clark's productivity will... | improve
+4 +3 +2 +1 0 -1 -2 -3 -4 | deteriorate |
| 2. Profit margins in the hydraulic line industry will... | improve
+4 +3 +2 +1 0 -1 -2 -3 -4 | deteriorate |
| 3. Clark's competitive position in the market will... | improve
+4 +3 +2 +1 0 -1 -2 -3 -4 | deteriorate |
| 4. Industry wide sales will... | increase
+4 +3 +2 +1 0 -1 -2 -3 -4 | decrease |
| 5. Clark's management is... | effective
+4 +3 +2 +1 0 -1 -2 -3 -4 | ineffective |
| 6. The hydraulic line industry is... | attractive
+4 +3 +2 +1 0 -1 -2 -3 -4 | unattractive |
| 7. Clark has a number of... | strengths
+4 +3 +2 +1 0 -1 -2 -3 -4 | weaknesses |
| 8. Clark's environment presents a number of... | opportunities
+4 +3 +2 +1 0 -1 -2 -3 -4 | threats |
| 9. Clark's situation over the last two year appears to be... | stable
+4 +3 +2 +1 0 -1 -2 -3 -4 | unstable |

Given your overall analysis of Clark's situation to what extent do you feel Clark should adopt each of the following corporate-level strategies over the next three years. Please use the following rating scale and circle your response.

- 5 - a desirable strategy
- 4 - a somewhat desirable strategy
- 3 - neither a desirable nor undesirable strategy
- 2 - a somewhat undesirable strategy
- 1 - an undesirable strategy

- 1 2 3 4 5 Concentration: growth is accomplished by selling the current product to the current market.
- 1 2 3 4 5 Liquidation: retraction is accomplished by selling the current business and terminating all business activities.
- 1 2 3 4 5 Market development: growth is accomplished by selling the current product to new markets.
- 1 2 3 4 5 Forward integration: growth is accomplished by establishing a new business in the firm's current distribution channel.
- 1 2 3 4 5 Divestiture: retraction is accomplished by selling or permanently closing a portion of the current business.
- 1 2 3 4 5 Conglomerate diversification: growth is accomplished by establishing a new business unrelated to the current business.
- 1 2 3 4 5 Horizontal integration: growth is accomplished by acquiring other businesses that produce the same product as the firm.
- 1 2 3 4 5 Retrenchment: retraction is accomplished by temporarily reducing operating levels in the current business.
- 1 2 3 4 5 Product development: growth is accomplished by selling a new product to the current market.
- 1 2 3 4 5 Concentric diversification: growth is accomplished by establishing a new business similar to or related to the current business in terms of products, markets, or technologies.
- 1 2 3 4 5 Backward integration: growth is accomplished by establishing a new business in the firm's current supply channel.

Background Information

Please complete the following concerning your current position and past work experience.

1. What is your current job title? _____
2. Which of the following represents the primary functional area of your current position?
(CHECK ONLY ONE)
 - _____ Procurement/purchasing
 - _____ Production/operations
 - _____ Marketing/sales
 - _____ Personnel
 - _____ Finance/accounting
 - _____ General administration
 - _____ Engineering/R&D
 - _____ Quality control
 - _____ Other
3. How many years have you worked in this functional area? _____
4. How many years have you been in this position? _____
5. How many years have you been with your current firm? _____
6. How many years have you been employed in auto-supplier firms? _____
7. Which one of the following best represents your educational status?
(CHECK ONLY ONE)
 - _____ high school graduate
 - _____ some college but no degree
 - _____ undergraduate degree, business major
 - _____ undergraduate degree, non-business major
 - _____ graduate degree, business major
 - _____ graduate degree, non-business major
8. Are you a member of the top policy and planning committee in your organization? _____ yes _____ no
9. How many people are members of the top policy and planning committee of your firm? _____
10. Would the CEO of your firm consider you to be
(CHECK ONLY ONE)
 - _____ executive level manager
 - _____ top level manager
 - _____ middle level manager
 - _____ lower level manager
 - _____ non-management employee

THANK YOU FOR YOUR PARTICIPATION IN THIS STUDY.

APPENDIX F

Table A-2
Descriptive Statistics, Correlation Matrix,
and Variable Definitions

Variable	Mean	SD	V1	V2	V3	V4	V5	V6
V1 Sample	.31	.46						
V2 Exttot-1	.57	1.48	-.06					
V3 Intttot-1	-.17	2.08	.05	.51				
V4 Access	.18	2.48	-.25	.04	.19			
V5 Value-1	-.06	1.00	.07	.63	.77	.10		
V6 DistO/T	.28	.45	-.06	-.08	.11	.02	.01	
V7 DistS/W	.30	.46	.01	.05	.01	.05	.04	-.41
V8 Exttot-2	.52	1.09	-.09	.31	-.08	-.02	-.12	.15
V9 Intttot-2	.01	1.43	-.08	-.01	.19	.09	-.03	.35
V10 Value-2	.06	1.00	-.07	-.63	-.77	-.10	-1.00	-.01
V11 Frame-2	1.50	.50	.04	.10	-.01	.25	.06	-.62
V12 PredOut	.47	.50	.01	-.06	-.12	.02	-.10	.04
V13 DistEq	.42	.50	.04	.03	-.11	-.07	-.04	-.53
V14 Cons	.70	.46	-.04	-.08	.05	.12	.05	-.01
V15 ConsCk	-.41	2.04	.13	.13	.06	-.04	.08	.17
V16 Exttot-3	.39	1.47	-.08	.32	.06	-.08	.10	.10
V17 Intttot-3	-.17	1.92	.00	.09	.26	-.08	.12	.27
V18 Value-3	-.06	1.00	.00	.10	.04	-.16	.11	.06
V19 Frame-3	1.50	.50	.04	.10	-.01	.25	.06	-.62
V20 Stable	.44	.50	.01	.06	.04	.02	.05	-.06
V21 StabCk	-.22	2.12	.05	.09	.17	-.20	.05	.22
V22 Concen	3.20	1.32	-.05	.10	.06	-.01	.02	-.08
V23 Liquid	1.49	.93	.04	-.25	-.11	-.05	-.11	.01
V24 Mktdev	3.92	1.09	.01	-.05	-.03	.08	-.01	.17
V25 Forwint	3.36	1.20	-.05	.03	.24	.19	.11	.08
V26 Divest	2.15	1.19	-.01	-.21	-.06	.08	-.15	-.05
V27 Congdiv	2.35	1.25	-.20	-.05	.07	.09	-.02	.07
V28 Horzint	3.03	1.17	-.02	.09	.13	.15	.10	.16
V29 Retrenc	2.50	1.25	-.11	-.12	-.02	.17	-.08	-.07
V30 Proddev	4.16	.92	-.01	-.04	.06	.04	.05	.04
V31 Concddiv	3.69	1.19	-.12	.06	.14	.15	.06	.02
V32 Backint	2.82	1.15	-.06	.00	.10	.20	.05	.01
V33 RDS	.00	1.00	-.03	.01	.05	.13	.04	.10
V34 WS	.00	1.00	-.03	-.25	-.10	.10	-.15	-.02
V35 UDS	.00	1.00	-.15	.02	.20	.21	.08	.07
V36 CS	.00	1.00	.05	.07	.06	.07	.03	.03
V37 YrFunc	12.19	7.45	-.05	-.03	-.04	.06	-.04	.06
V38 YrPost	5.99	5.76	.12	.01	-.08	-.02	.02	-.07
V39 YrFirm	10.80	9.97	.21	.04	-.06	-.06	.01	-.09
V40 YrInds	15.45	9.96	.10	-.01	-.05	.02	-.01	-.01
V41 TopTeam	.83	.38	.13	.00	.05	-.04	.07	-.05
V42 MgtLevel	1.51	.74	-.19	-.02	-.12	.15	-.13	.03

Table A-2 (cont'd.)

Variable	V7	V8	V9	V10	V11	V12	V13	V14	V15
V1 Sample									
V2 Exttot-1									
V3 Intttot-2									
V4 Access									
V5 Value-1									
V6 DistO/T									
V7 DistS/W									
V8 Exttot-2	-.23								
V9 Intttot-2	-.31	.30							
V10 Value-2	-.04	.12	.03						
V11 Frame-2	.65	-.11	-.37	-.06					
V12 Predout	.00	.15	-.01	.10	-.02				
V13 DistEq	-.56	.07	.02	.04	-.05	-.03			
V14 Cons	.37	-.18	-.05	-.05	.35	-.06	-.34		
V15 ConsCk	-.18	.24	.19	-.08	-.21	-.14	.01	-.12	
V16 Exttot-3	-.13	.46	.20	-.10	-.08	-.07	.03	-.10	.26
V17 Intttot-3	-.26	.17	.54	-.12	-.33	-.10	.00	-.13	.22
V18 Value-3	-.01	.12	.04	-.11	-.06	-.04	-.04	-.05	.12
V19 Frame3	.56	-.11	-.37	-.06	1.00	-.02	-.05	.35	-.20
V20 Stable	-.05	-.01	-.07	-.05	.07	-.05	.01	.01	-.01
V21 StabCk	-.23	.17	.37	-.05	-.30	-.05	.01	-.13	.34
V22 Concen	.09	.12	.06	-.02	.15	.00	-.02	-.01	.13
V23 Liquid	.02	-.16	-.05	.11	.02	.00	-.03	-.02	-.13
V24 Mktdev	-.10	.00	.13	.01	-.19	.10	-.07	-.04	.02
V25 Forwint	-.12	.05	.18	-.11	-.11	-.08	.04	-.15	.15
V26 Divest	.08	-.19	-.08	.15	.10	-.04	-.03	.02	-.14
V27 Congdiv	-.10	-.03	.16	.02	-.06	-.06	.04	-.14	-.04
V28 Horzint	-.11	.13	.11	-.10	-.05	-.07	-.04	-.05	.06
V29 Retrenc	.11	-.18	-.08	.08	.21	.03	-.03	.09	-.14
V30 Proddev	-.03	-.12	.17	-.05	-.06	-.02	-.01	.00	.05
V31 Concdiv	.04	.03	.20	-.06	.08	.05	-.06	.05	.10
V32 Backint	.04	.10	.10	-.05	.09	-.05	-.05	.02	.03
V33 RDS	-.05	-.06	.14	-.04	-.08	.03	-.04	.01	.06
V34 WS	.07	-.26	-.10	.15	.12	-.01	-.05	.06	-.19
V35 UDS	-.07	.07	.20	-.08	-.03	-.11	.00	-.12	.10
V36 CS	-.02	.13	.08	-.03	.08	-.05	-.05	-.03	.10
V37 YrFunc	.06	-.01	-.01	.04	-.03	-.06	-.10	.03	.03
V38 YrPost	.11	-.19	-.14	-.02	.03	.00	-.04	.04	-.11
V39 YrFirm	.08	-.08	-.10	-.02	.03	.04	.01	-.01	-.04
V40 YrInds	.07	-.12	-.07	.01	-.01	.02	-.05	-.07	-.06
V41 TopTeam	.03	-.06	-.07	-.06	.03	-.09	.02	.07	.03
V42 MgtLevel	-.05	.04	.10	.13	.04	.06	.02	-.09	-.05

Table A-2 (cont'd.)

Variable	V16	V17	V18	V19	V20	V21	V22	V23	V24
V1 Sample									
V2 Exttot-1									
V3 Intttot-1									
V4 Access									
V5 Value-1									
V6 DistO/T									
V7 DistS/W									
V8 Exttot-2									
V9 Intttot-2									
V10 Value-2									
V11 Frame-2									
V12 PredOut									
V13 DistEq									
V14 Cons									
V15 ConsCk									
V16 Exttot-3									
V17 Intttot-3	.60								
V18 Value-3	.65	.58							
V19 Frame-3	-.08	-.33	-.06						
V20 Stable	.06	-.04	.05	.07					
V21 StabCk	.58	.79	.61	-.30	.02				
V22 Concen	.29	.16	.20	.15	.03	.22			
V23 Liquid	-.21	-.08	-.02	.02	.04	-.05	-.01		
V24 Mktdev	-.07	.04	-.03	-.19	-.10	.00	.02	-.21	
V25 Forwint	-.02	.15	-.08	-.11	.04	.06	-.19	-.10	.06
V26 Divest	-.35	-.25	-.29	.10	.07	-.25	-.14	.50	-.10
V27 Congdiv	.08	.17	.13	-.06	.01	.05	.00	.14	.05
V28 Horzint	.17	.20	.11	-.05	.01	.12	.14	-.11	.12
V29 Retrenc	-.39	-.30	-.42	.21	.11	-.35	-.19	.22	-.05
V30 Proddev	-.12	.02	-.13	-.06	-.15	.01	.01	-.34	.39
V31 Concdiv	.14	.22	.03	.08	.00	.12	.00	-.25	.11
V32 Backint	.07	.11	.05	.09	.05	.03	-.04	.04	-.02
V33 RDS	-.10	.02	-.16	-.08	-.09	-.04	-.13	-.53	.63
V34 WS	-.44	-.30	-.36	.12	.07	-.31	-.19	.59	-.01
V35 UDS	.12	.24	.08	-.03	.06	.11	-.08	.01	-.09
V36 CS	.30	.22	.25	.08	.03	.23	.79	.10	.03
V37 YrFunc	.10	.05	-.02	-.03	.20	.09	.04	.08	-.12
V38 YrPost	-.07	-.08	-.05	.03	.14	-.05	.01	.10	-.13
V39 YrFirm	.03	-.06	.04	.03	.03	-.04	.06	.00	-.08
V40 YrInds	-.10	-.15	-.14	-.01	.11	-.09	.04	.09	.06
V41 TopTeam	-.03	-.11	-.05	.03	-.02	-.02	-.05	.11	-.07
V42 MgtLevel	.06	.06	-.03	.04	-.02	-.04	-.02	-.05	.08

Table A-2 (cont'd.)

Variable	V25	V26	V27	V28	V29	V30	V31	V32	V33
V1 Sample									
V2 Exttot-1									
V3 Intttot-1									
V4 Access									
V5 Value-1									
V6 DistO/T									
V7 DistS/W									
V8 Exttot-2									
V9 Intttot-2									
V10 Value-2									
V11 Frame-2									
V12 Predout									
V13 DistEq									
V14 Cons									
V15 ConsCk									
V16 Exttot-3									
V17 Intttot-3									
V18 Value-3									
V19 Frame-3									
V20 Stable									
V21 StabCk									
V22 Concen									
V23 Liquid									
V24 Mktdev									
V25 Forwint									
V26 Divest	.07								
V27 Congdiv	.40	.19							
V28 Horzint	.01	-.08	-.01						
V29 Retrenc	.02	.49	.10	-.02					
V30 Proddev	.08	-.13	.02	.18	.00				
V31 Concddiv	.24	-.06	.16	.15	.00	.44			
V32 Backint	.37	.15	.24	.11	.16	.06	.20		
V33 RDS	.09	-.16	-.09	.30	.13	.84	.56	.06	
V34 WS	-.11	.83	.14	.05	.81	-.02	-.10	.15	.00
V35 UDS	.79	.15	.71	.08	.04	.03	.39	.68	.00
V36 CS	-.25	-.06	.04	.66	-.13	.07	.07	.13	.00
V37 YrFunc	-.05	-.05	.04	.06	.07	.02	-.05	-.11	-.05
V38 YrPost	-.09	.12	.02	.01	-.01	.05	-.05	-.05	-.05
V39 YrFirm	-.17	-.04	-.09	-.10	-.10	-.06	-.11	-.23	-.10
V40 YrInds	-.05	.01	-.03	-.06	.04	.06	-.14	-.18	.00
V41 TopTeam	.01	.16	-.22	.12	.00	.03	-.03	.08	.01
V42 MgtLevel	.02	-.08	.25	-.13	.12	-.02	.04	.12	.00

Table A-2 (cont'd.)

Variable	V34	V35	V36	V37	V38	V39	V40	V41
V1 Sample								
V2 Exttot-1								
V3 Intttot-1								
V4 Access								
V5 Value-1								
V6 DistO/T								
V7 DistS/W								
V8 Exttot-2								
V9 Intttot-2								
V10 Value-2								
V11 Frame-2								
V12 Predout								
V13 DistEq								
V14 Cons								
V15 ConsCk								
V16 Exttot-3								
V17 Intttot-3								
V18 Value-3								
V19 Frame-3								
V20 Stable								
V21 Stabck								
V22 Concen								
V23 Liquid								
V24 Mktdev								
V25 Forwint								
V26 Divest								
V27 Congdiv								
V28 Horzint								
V29 Retrenc								
V30 Proddev								
V31 Concdiv								
V32 Backint								
V33 RDS								
V34 WS								
V35 UDS	.00							
V36 CS	.00	.00						
V37 YrFunc	.03	-.05	.07					
V38 YrPost	.08	-.05	.05	.53				
V39 YrFirm	-.08	-.21	-.01	.22	.45			
V40 YrInds	.05	-.16	-.01	.32	.43	.60		
V41 TopTeam	.12	-.04	-.06	.04	.14	.01	.16	
V42 MgtLevel	.00	.14	-.08	-.07	-.16	-.13	-.18	-.67

Table A-2 (cont'd.)

V1	Sample: Managerial sample (Michigan=0, US=1).
V2	Exttot-1: External decision frame score at end of Part 1 (opportunity=positive, threat=negative).
V3	Inttot-1: Internal decision frame score at end of Part 1 (strength=positive, weakness=negative).
V4	Access: Managers' accessible decision frames (internal=positive, external=negative).
V5	Value-1: Value of attribute data in Part 1 (negative=-1, positive=+1).
V6	DistO/T: Managers who received distinctive opportunity/threat data in Part 1 (1) vs. all others (0).
V7	DistS/W: Managers who received distinctive strength/weakness data in Part 1 (1) vs. all others (0).
V8	Exttot-2: External decision frame score at end of Part 2 (opportunity=positive, threat=negative).
V9	Inttot-2: Internal decision frame score at end of Part 2 (strength=positive, weakness=negative).
V10	Value-2: Value of attribute data in Part 2 (negative=-1, positive=+1).
V11	Frame-2: Frame manipulated in Part 2 (external=1, internal=2).
V12	Predout: Managers who received predictor data (0) vs. managers who received outcome data (1) in Part 2.
V13	DistEq: Managers who received distinctive data (0) vs. managers who received equivocal data (1).
V14	Cons: Managers who received inconsistent data (1) vs. managers who did not receive inconsistent data (0).
V15	ConsCk: Inconsistent data manipulation check (inconsistent=negative, not inconsistent=positive)
V16	Exttot-3: External decision frame score at end of Part 3 (opportunity=positive, threat=negative).
V17	Inttot-3: Internal decision frame score at end of Part 3 (strength=positive, weakness=negative).
V18	Value-3: Value of attribute data in Part 3 (negative=-1, positive=+1).
V19	Frame-3: Frame manipulated in Part 3 (external=1, internal=2).
V20	Stable: Managers who received unstable data (0) in Part 3 vs. managers who received stable data (1).
V21	Stabck: Stability manipulation check (stable=positive, unstable=negative).

Table A-2 (cont'd.)

V22 Concen: Concentration strategy.
V23 Liquid: Liquidation strategy.
V24 Mktdev: Market development strategy.
V25 Forwint: Forward integration strategy.
V26 Divest: Divestment strategy.
V27 Congdiv: Conglomerate diversification strategy.
V28 Horzint: Horizontal integration strategy.
V29 Retrenc: Retrenchment strategy.
V30 Proddev: Product development strategy.
V31 Concddiv: Concentric diversification strategy.
V32 Backint: Backward integration strategy.
V33 RDS: Related-diversification strategy factor.
V34 WS: Withdrawal strategy factor.
V35 UDS: Unrelated-diversification strategy factor.
V36 CS: Concentration strategy factor.
V37 YrFunc: Years worked in functional area.
V38 YrPost: Years in current position.
V39 YrFirm: Years in current firm.
V40 YrInds: Years employed in auto-supplier firms.
V41 TopTeam: Member of top policy and planning committee (no=0, yes=1).
V42 MgtLevel: Level of manager position (1-executive, 5-non-manager).

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