

**RECONSIDERING THE STRATEGIC IMPLICATIONS  
OF DECISION COMPREHENSIVENESS**

**DANIEL P. FORBES**

University of Minnesota, Carlson School of Management  
Dept. of Strategic Management & Organization, #3-365  
321 – 19<sup>th</sup> Ave. South, Minneapolis, MN 55455  
ph: 612.625.2989; fax: 928.447.4733  
email: dforbes@csom.umn.edu

This is the accepted draft, dated November 1, 2005,  
which was subsequently published in the *Academy of Management Review*.

This manuscript is made available under the CC-BY-NC-ND 4.0 license  
<http://creativecommons.org/licenses/by-nc-nd/4.0/>

Please cite the published version of this paper using the information below:  
Forbes, D.P., 2007. Reconsidering the strategic implications of decision comprehensiveness.  
*Academy of Management Review*, 32(2): 361-376.

**Acknowledgements:**

I am grateful to Phil Bromiley, Bill Glick, Audrey Korsgaard, Theresa Lant, Frances Milliken,  
Harry Sapienza, Myles Shaver, Anand Swaminathan, Mary Zellmer-Bruhn,  
and the reviewers, among others, for their help with these ideas.

## **ABSTRACT**

### **RECONSIDERING THE STRATEGIC IMPLICATIONS OF DECISION COMPREHENSIVENESS**

A key question in strategy process research is whether comprehensiveness enables firms to make better strategic decisions in various environments. I identify two problems that have hindered past studies' efforts to answer this question. Specifically, I show that past studies in this area have generally theorized about a different dependent variable than they have measured and have conflated the concepts of uncertainty, ambiguity and instability in accounting for environmental moderation. I then reframe the relevant question and propose ways of characterizing organizational information environments so researchers can identify more precisely those real-world contexts across which the value of comprehensiveness varies.

*[100 words]*

An important and longstanding question in strategy process research is whether comprehensiveness enables firms to make better strategic decisions in various environmental contexts (e.g., Bourgeois & Eisenhardt, 1988; Fredrickson, 1984; Glick, Miller & Huber, 1993; Ireland & Miller, 2004). Although there exists a relatively large literature on this question, there are two problems of theoretical and methodological imprecision that have hindered that literature's progress. First, although scholars have generally theorized about the effects of comprehensiveness on decision quality, in most cases they have not actually tested that link in their empirical studies. Instead, they have tended to test the effects of comprehensiveness on firm performance. This is problematic, because these relationships are not equivalent: The latter is more theoretically complex than the former (Dean & Sharfman, 1996; Langley, 1989). Second, scholars have tended to theorize about and test for the moderating effects of environmental instability (e.g., Fredrickson, 1984). This is problematic, because instability is too general a concept to serve as a reliable moderator of the effects of comprehensiveness on decision quality. This is evident in the fact that if we look carefully at how scholars have theorized about such moderating effects, we see that they have used instability as a proxy for both ambiguity and uncertainty – two different types of decision making contexts that are more precise than instability and which are likely to exert different moderating effects.

In this article, I analyze both of these problems in some detail. Then, pursuing the implications of these analyses, I propose that future researchers in this area should focus on the link between comprehensiveness and decision quality and that, in addition, they should try to assess the extent to which organizations' strategic decision making contexts more closely approximate ambiguity or uncertainty. In developing this latter recommendation, I build on

Huber and Daft's (1987) concept of the "organizational information environment", a concept that is more specific and more germane to the task of strategic decision making than the general organizational environment, to propose a way for researchers to identify more precisely those real-world contexts across which the value of comprehensiveness is likely to vary.

I emphasize that it is not my intent in this article to attempt to reconcile the past empirical findings of the comprehensiveness literature. As I noted earlier, most of those findings are based on the study of a more expansive theoretical link than the one I am concerned with here. Moreover, as I reveal in a brief review of those findings, the fragmentation of that literature poses a potentially insurmountable impediment to such a reconciliation at the same time that it underscores the need for more precise theoretical reasoning and for frameworks that facilitate more precise empirical analyses. Accordingly, my intent instead is to analyze the aforementioned problems and to consider the implications those analyses. The approach that I take in doing so runs counter to the prevailing approach of the comprehensiveness literature, but it is not incompatible with any consistent pattern of findings from that literature. Moreover, my approach is consistent with certain arguments advanced in a recent empirical study that showed that comprehensiveness had different effects on new product performance in different unstable environments (Atuahene-Gima & Li, 2004). In addition, my approach is consistent with veins of theorizing that transcend and precede the comprehensiveness literature, including information processing theory and behavioral theory. I elaborate on each of these points in the pages that follow.

The insights developed in this article are important for several reasons. First, they advance the comprehensiveness literature by making more explicit the implicit theoretical bases of its constituent arguments. Doing this, as I explain below, clarifies future opportunities for that

literature and also helps to integrate it with larger and older bodies of work that inform strategy process research, such as information processing theory and behavioral theory. Second, the insights developed here are relevant to other areas of research, such as those concerned with the strategic implications of managerial cognition or of other decision making processes (e.g., Schoemaker, 1993; Rajagopalan, Rasheed, Datta & Spreitzer, 1997). Finally, to the extent that articles in the popular business press perennially offer advice on strategic decision making that both reinforces and challenges the value of comprehensiveness (e.g., Carlin, 1995; Cronin, 2000), insights that clarify our thinking about these issues are likely to be of interest beyond academia as well.

## **BACKGROUND**

In this section, I provide an overview of the comprehensiveness literature and of the core concepts I will use to structure my analyses.

The core variable of this literature is strategic decision comprehensiveness, a concept that captures the extensiveness with which an organization's top executives systematically gather and process information from the external environment in making strategic decisions (Fredrickson, 1984; Glick, Miller & Huber, 1993). Firms that scan their environments for greater quantities of information or which analyze environmental information more extensively, for example by employing quantitative analytic techniques to a greater degree (Dean & Sharfman, 1993), are held to be more comprehensive. In short, comprehensiveness distills the essence of the "synoptic" approach to strategy (Ansoff, 1965; Hofer & Schendel, 1978) into a single dimension of strategic decision making (Fredrickson & Mitchell, 1984).

Research on comprehensiveness includes studies of its antecedents as well as its consequences (e.g., Papadakis, Lioukas & Chambers, 1998), but for the purposes of this article I define “the comprehensiveness literature” to include only studies of its consequences. As one would expect, the contributing authors in this stream of literature reference and draw upon one another’s prior work in the course of framing and interpreting their own studies (e.g., Glick, Miller & Huber, 1993; Hough & White, 2003; Papadakis, 1998). Accordingly, the stream constitutes a coherent and continuing conversation about whether and when comprehensiveness is strategically valuable to organizations. Nevertheless, as with many areas of organizational research (e.g., Boyd, 1991), the studies in this area exhibit some variation with regard to the labeling, definition and measurement of the core concepts. Each of these instances of variation represents an opportunity for scholars to more carefully interrogate this literature and its associated ideas. It is one of my central purposes in this article to highlight some of these variations and the complexities they reflect and, indeed, to call into question some aspects of this literature’s coherence. However, I cannot critically examine all of this literature’s variations simultaneously. Moreover, in order to proceed with any holistic consideration of the questions in this area, it is incumbent upon me to begin by defining the relevant literature and its constituent concepts in a way that stays faithful to the sense of coherence that prior scholars in this area have imparted to those things. Accordingly, I will leave some conceptual and methodological variations unexplored here in order to focus on others and on commonalities of theoretical argumentation among the studies. This admittedly represents a limitation of my analyses. However, it is one that necessarily accompanies any effort to derive integrative insights from this large and complex literature.

Consistent with this approach, I define the comprehensiveness literature to include studies that employ slight variations of the core independent variable, notably “decision rationality” and “procedural rationality”, and I use “comprehensiveness” as an umbrella term to minimize linguistic confusion.

The core dependent variable I am concerned with is the concept of strategic decision quality (Amason, 1996; Dooley & Fryxell, 1999). As I mentioned above, most empirical studies in this area have actually studied firm performance as an outcome variable instead. However, most of the theorizing in this literature is conducted with reference to decision quality as a mediating concept, in spite of the fact that other mediators have occasionally been proposed (e.g., Bourgeois & Eisenhardt, 1988). Dean and Sharfman (1996) outlined the general logic of this mediating relationship in their article entitled, “Does decision process matter?” They explained that “the argument [that it does matter] rests on two assumptions: 1) that different processes lead to different choices, ... and 2) that different choices lead to different outcomes” (p. 369). Accordingly, the concept of decision quality can be understood to correspond to the extent to which firms’ decisions reflect accurate understandings of the causal relationships that link strategic choices with strategic outcomes.

The core moderating variable that has traditionally been employed in this literature is the concept of environmental instability. Some studies have employed variants of this concept, including environmental “dynamism” (e.g., Priem, Rasheed & Kotulic, 1995), “velocity” (Bourgeois & Eisenhardt, 1988) and “turbulence” (Glick *et al*, 1993), but these concepts generally correspond to the same basic dimension that organization theorists have used to describe organizational environments. That dimension, which I will call “instability” for the sake of simplicity, is concerned with the presence of “rapid and discontinuous change” (Bourgeois &

Eisenhardt, 1988: p. 816) in the organizational environment, and is often contrasted with two other dimensions, “munificence” and “complexity” (Dess & Beard, 1984; Huber & Daft, 1987; Sutcliffe, 2000). I discuss environmental instability and its connection to the central question of this literature at more length in subsequent sections.

An illustrative profile of recent work in this literature is provided in Table 1.

\*\*\* Insert Table 1 \*\*\*

## **REASONS TO REFRAME THE QUESTION**

In the next three sections, I explain why the central question of the comprehensiveness literature needs to be reframed. In the first of these sections, I outline the two main theoretical perspectives that have been invoked in past studies and explain how the apparent conflict between them has been used to frame the central question of this literature. In the section after that, I briefly review the empirical findings of past studies. In doing so, I explain why those studies’ collective ability to speak to that question is limited. In the section after that, I explain a theoretical problem associated with the framing of that question.

### **An overview of the two main perspectives**

The studies in the comprehensiveness literature feature two main lines of argument, or perspectives, regarding the strategic implications of comprehensiveness. These perspectives can be summarized and contrasted with reference to a common set of considerations, which Figure 1 depicts: 1) the benefits of comprehensiveness, or more specifically the extent to which managers can improve the degree of strategic understanding they possess about their environments by



being more comprehensive, and 2) the costs of comprehensiveness, specifically the time and resources consumed by the decision making process, relative to those benefits. The two perspectives diverge in their assessments of how instability affects those benefits and costs.

\*\*\* Insert Figure 1 \*\*\*

According to the *first perspective*, instability *increases the benefits* that can be attained through comprehensiveness. For example, Glick, Miller and Huber (1993) emphasize that “turbulent environments require management teams to determine if the conditions underlying opportunities and threats are highly transient and this, in turn, requires the collection and analysis of a great amount of information” (p. 189). Dean and Sharfman (1996) further claim that “managers in stable settings,” by contrast, “will already have an experience-based understanding of their environment and thus will have less need to engage in information collection and analysis in order to make effective choices” (p. 376). Likewise, Miller and Friesen (1983) contend, “A dynamic environment must be studied more carefully and diligently to afford executives with an adequate degree of mastery” (p. 223).

The *second perspective* contends that instability *decreases the benefits* that can be attained through comprehensiveness while simultaneously *increasing its costs*. For example, Fredrickson and Mitchell (1984) contend that “a stable environment increases the likelihood that the critical variables can be identified, and it allows theory to be developed regarding the relationships between those variables and the organization” (p. 404). By contrast, they contend that “a highly unstable environment makes it difficult to achieve the level of certainty sought by rational models,” because unstable environments

comprise “a changing list of opportunities and threats that defy thorough understanding” (p. 404-405). Hough and White (2003) further argue that “new but contradictory information [in unstable environments] may actually slow the decision-making process and negatively impact performance,” whereas “in more stable environments, ... decision makers can identify the critical variables” so that “rational processes [can] ... increase decision quality” (pp. 486-7).

Thus, these two perspectives render contrasting predictions about the benefits and costs of comprehensiveness in unstable environments. Calling attention to this contrast, scholars in the comprehensiveness literature have frequently characterized the two perspectives as “competing theories” (Priem *et al*, 1995: p. 914) whose conflict corresponds to an ongoing empirical dispute (e.g., Goll & Rasheed, 1997; Papadakis, 1998). Accordingly, scholars have often framed their empirical results as rendering support for one perspective over the other (e.g., Fredrickson & Mitchell, 1984; Glick *et al*, 1993; Hough & White, 2003). Over time, these practices have both reflected and reinforced the common perception that a debate between these two perspectives frames the central question of this literature. In the next section, I show that not only do the empirical findings of this literature fail to provide consistent support for either perspective, they also raise larger questions about the framing of this central question.

### **A brief review of past empirical work**

Table 1 summarizes nine studies that have appeared in the comprehensiveness literature since 1990. If we examine the studies in this table in an effort to interpret their accumulated empirical findings with respect to the central question framed above, we encounter several major difficulties.

First, there is some divergence between the theoretical arguments invoked in the two main perspectives and the relationships actually examined in the studies. Most notably, most of these studies have examined the link between comprehensiveness and firm performance, not decision quality. It is understandable and reasonable that strategy researchers interested in the effects of comprehensiveness on decision quality should believe that those effects also exert some influence on firm performance in at least some circumstances. However, these two sets of effects are not wholly interchangeable.

To begin with, other explanations besides decision quality have been proposed as mediators of the link between comprehensiveness and firm performance, including some that reference the potential for comprehensiveness to impact various internal organizational processes, such as managers' psychological states (e.g., Bourgeois & Eisenhardt, 1988; Langley, 1989), and others that reference the potential for comprehensiveness to impact external perceptions of the firm's legitimacy, such as those held by key resource providers (Stone & Brush, 1996). Second, the link between decision quality and firm performance is likely to be subject to moderating effects that do not necessarily apply to the link between comprehensiveness and decision quality. For example, external factors that limit managerial discretion, such as industry structure or government regulation (Hambrick & Finkelstein, 1987; Pfeffer & Salancik, 1978), may substantially weaken the link between decision quality and firm performance without necessarily affecting the link between comprehensiveness and decision quality. Third, the causal link between strategic decision processes and firm performance need not be one-way: Firm performance may influence such processes as well (Sapienza, Korsgaard, Goulet & Hoogendam, 2000), and the cross-sectional approaches employed by many studies in this area (e.g., Glick et al, 1993; Papadakis, 1998; Priem et al, 1995) make it impossible to rule

out such effects. For all of these reasons, it would be inappropriate to interpret the empirical findings of those studies that use performance as a dependent variable as though they provide clear and reliable insight about the link between comprehensiveness and decision quality.

Even if we were to set such considerations aside, Table 1 makes clear that the empirical studies are highly fragmented in ways that further hinder their ability to provide collective insight. To begin with, the findings are extremely heterogeneous, encompassing not only results that might appear to correspond to the two main perspectives but also the results of studies that looked for environmental moderation but did not find it (e.g., Dean & Sharfman, 1996), studies that found mixed evidence of a moderating effect (e.g., Glick et al, 1992) and studies that found evidence of subtle, unconventional forms of moderation (e.g., Atuahene-Gima & Li, 2004; Goll & Rasheed, 1997). In addition, the studies exhibit considerable conceptual and methodological variation. For example, several studies employ archival measures to capture the moderating effects of instability (e.g., Glick, Miller & Huber, 1993; Dean & Sharfman, 1996) while others employ perceptual measures for this purpose (e.g., Priem, Rasheed & Kotulic, 1995; Zahra *et al*, 2002). At the same time, however, these variations do not seem to correspond in any consistent way to the emergence of particular findings. For example, the study by Zahra and colleagues (2002) and the study by Atuahene-Gima and Li (2004) yielded completely different empirical findings in spite of the fact that both studies employed perceptual measures of the environmental moderator.

To summarize, although it is common for scholars to characterize the empirical findings of this literature as “mixed” in a manner that suggests that those findings align with both of the literature’s two main perspectives (e.g., Atuahene-Gima & Li, 2004; Hough & White, 2003), the reality is more complex: Past studies actually exhibit considerable fragmentation with respect to

their methods, including most notably their choice of dependent variable, as well as their findings. This state of affairs does more than leave the central question of this literature unresolved: It points towards a larger issue of whether there are better ways to frame that question altogether. In the next section, I show that the case for reframing the question is further strengthened by a theoretical examination of the two main perspectives. Specifically, I show that their respective arguments correspond to theories that precede the comprehensiveness literature itself and that, in fact, those theories are meant to refer to environmental situations that are materially different from one another.

### **Distinguishing among instability, uncertainty and ambiguity**

The concept of environmental instability around which the comprehensiveness literature has centered its theorizing is derived from what Huber and Daft (1987) characterized as a “typology-building literature” within organizational sociology, which has sought to identify dimensions of the external environment of organizations. The definition of instability has changed slightly over the years, but most recent definitions (e.g., Eisenhardt, 1989; Wholey & Brittain, 1989) maintain that it encompasses the presence of “rapid and often discontinuous changes” in the organizational environment (Henderson & Stern, 2004: p. 41).

Comprehensiveness scholars have inferred that variations in environmental instability affect the capacity of managers to discern which strategic choices will lead to which outcomes. This inference has understandable appeal, but its connection to theories of organizational decision making is not straightforward. One factor that complicates this connection is that decision making scholars have developed different theories corresponding to different *kinds* of environments in which prediction is difficult. Of particular interest in this context is the tradition

of research on organizational decision making that has distinguished ambiguity from uncertainty and maintained that the managerial processes appropriate to each are likely to be different (e.g., Becker, 2001; Courtney, Kirkland & Viguerie, 1997; March, 1988).

Scholars have sometimes defined ambiguity and uncertainty differently depending on which philosophical assumptions they have held, and which specific literature and historical era they have written in (Camerer and Weber, 1992; Milliken, 1987). A common distinction between these two terms, however, is one that captures two different levels of knowledge that decision makers may possess about a hypothetical decision making context (e.g., Curley & Yates, 1985; Kahn & Sarin, 1988). Formally speaking, under conditions of “uncertainty”, decision makers are said to know the probabilities associated with a set of possible outcomes even though they do not know exactly which outcome will occur; by contrast, “ambiguity is defined as uncertainty about the processes by which outcomes are determined, and has been characterized as uncertainty about the outcome probabilities themselves” (Curley, Yates & Adams, 1986; p. 230). Clearly, managers in real-world organizational settings seldom experience pure ambiguity or uncertainty in precisely the sense captured by these formal definitions (Einhorn & Hogarth, 1986). However, scholars of organizational decision making have theorized that there exists a difference between real-world decision contexts that is analogous to those that separate these experimental conditions and that these differences between ambiguity and uncertainty as they are manifested in real-world settings are likely to have implications for the effectiveness of alternative decision making techniques.

Comprehensiveness scholars have invoked these ideas in making arguments about the value of comprehensiveness in unstable environments. For example, the arguments employed by the first of the comprehensiveness literature’s two main perspectives correspond to a set of

arguments made with reference to the context of uncertainty within the tradition of information processing theory (Galbraith, 1977; Tushman & Nadler, 1978). Information processing theory holds that the need to reduce uncertainty is one of the most critical tasks organizations face and that uncertainty can be reduced through the collection and processing of additional environmental information. Egelhoff (1991) elaborates on these arguments in a way that closely parallels the arguments made in the first perspective of the comprehensiveness literature:

[Galbraith] rigorously defined the concept of uncertainty in terms of information processing: 'Uncertainty is the difference between the amount of information required to perform the task and the amount of information already possessed by the organization.' Thus, there is a relationship between the amount of uncertainty faced by an organization and the amount of information processing that must go on in an organization. Effective organizations are those that fit their information-processing capacities ... to the amount of uncertainty they face. (p. 343).

The arguments employed by the second perspective, on the other hand, correspond to a set of arguments made with reference to the context of ambiguity within the tradition of behavioral theory (March & Olsen, 1975; March, 1988) and elsewhere (e.g., Courtney et al, 1997). This literature on ambiguity emphasizes the futility of rational decision techniques under certain circumstances in a way that closely parallels the way adherents of the second perspective of the comprehensiveness literature (e.g., Fredrickson & Mitchell, 1984) theorize about the value of comprehensiveness in unstable environments. For example, March (1988) contends that "although many decision problems in contemporary organizations will fall comfortably within the domain of [rational] decision theory and yield gracefully to its dictates, many of the more interesting ones will not" (p. 399). In particular, March explains, "a close articulation of decisions and information is of little use in ambiguous situations" (p. 399). More recently, Mosakowski (1997) extends these arguments in ways that parallel the strategic recommendations

made by scholars who have questioned the value of comprehensiveness in dynamic environments, such as Brown and Eisenhardt (1998): She contends that the condition of ambiguity “shifts attention away from making the so-called ‘right’ decision toward managing the strategy-making process” (p. 414), and, like them, she proposes alternative techniques for managing under these conditions, emphasizing a reflective process of carefully targeted “trials”, or “calculative experimentation”.

That the comprehensiveness literature employs arguments associated with either or even both of these theories is not inherently problematic. What is problematic is that the critical distinction between uncertainty and ambiguity that is reflected in the original formulations of these theories has been persistently conflated within the comprehensiveness literature through references to the vaguer concept of instability and its analogues (e.g., dynamism, turbulence) and, relatedly, by the comprehensiveness literature’s adoption of the general colloquial tendency to loosely interchange all three concepts. These practices cause scholars in this area to continually – and predictably – contradict one another. For example, Hough and White (2003) raise questions about the value of comprehensiveness in “dynamic” environments as opposed to “static” ones (p. 484); yet these claims clash with Priem and colleagues’ (1995) claim that “firms in highly dynamic environments should adopt more comprehensive rather than less comprehensive decision making processes” (p. 927).

### **Summary of the need to reframe the question**

In the prior three sections, I identified some problems of methodological and theoretical imprecision that have hindered the progress of the comprehensiveness literature. These problems have important consequences. First, they foster confusion among researchers and managers who



seek to make sense of this literature. Second, they threaten to diminish the quality of theorizing in this area as well as the literature's overall significance in the long term. One reason for this is that continued theorizing and study with reference to the overly general category of unstable environments will ensure that the arguments and findings of the comprehensiveness literature remain incommensurable with the insights of either information processing theory or behavioral theory, two important theoretical traditions that inform contemporary strategy process research. Over time, this is likely to leave the comprehensiveness literature theoretically isolated, thereby inhibiting its potential to draw on and contribute to advances in other areas. For all of these reasons, it behooves us to consider whether the central question of this literature could be reframed in a way that has the potential to resolve these problems.

### **REFRAMING THE QUESTION**

In this section I take up the challenge of reframing the central question of the comprehensiveness literature. I begin by considering a recent partial response to this challenge. I then propose an alternative response.

#### **A recent partial response: Separating “demand” and “technology” considerations**

Atuahene-Gima and Li (2004) alluded to one of the problems I describe above in their recent study of the effects of comprehensiveness on new product development outcomes in high-technology ventures. In that study, they proposed that the arguments corresponding to what I have called the first and second perspectives of this literature applied to conditions of “perceived demand uncertainty” and “perceived technological uncertainty”, respectively. This innovative approach helps to move the discussion of these issues past the zero-sum debate that has

historically framed it, and it underscores my general contention that unstable environments may vary in ways that affect the value of decision comprehensiveness. But while this study represents a constructive addition to the literature, it represents an incomplete response to the problems I identify for several reasons.

First, this study's approach continues to sidestep the critical distinction between uncertainty and ambiguity, which represents the most parsimonious way of distinguishing between the contexts to which these perspectives refer. Accordingly, the approach reflects some context-specific assumptions that constrain the applicability of its insights. For example, the assumption that "technology" and "demand" represent the two most central categories of strategic consideration, like the thesis that technology is inherently more difficult to analyze than demand, may be plausible in the context of certain high-technology firms but may not hold in other settings. Moreover, this study's distinction between "technology uncertainty" and "demand uncertainty" mirrors the dichotomous distinction that has been drawn between ambiguity and uncertainty in a way that perpetuates some of the limitations associated with that distinction. For example, while a sharp distinction may be useful in separating formal decision making contexts, it is less useful as a characterization of real-world task environments, which are likely to exhibit incremental variation, both within and beyond the particular domains of demand and technology. Finally, this study's focus on the moderating effects of managerial perceptions, as opposed to the moderating effects of objective features of the decision making context, increases the potential for common method bias in studies that employ survey-based measures of comprehensiveness and raises other theoretical and methodological challenges (Boyd, Dess & Rasheed, 1993) that limit the appeal of this approach.

## **An alternative response**

In the sections that follow, I propose a framework that represents an alternative and more complete way of reframing the central question of this literature. Like the response proposed by Atuahene-Gima and Li, this framework presumes that the first and the second perspectives of this literature are each valid within certain contextual parameters. What distinguishes my approach from theirs, however, is that I associate those parameters with the extent to which they cause managers to experience decision making conditions akin to uncertainty as opposed to conditions akin to ambiguity, and I define those parameters with reference to objective features of the environment that are subject to incremental variation. These features of the framework warrant some elaboration.

First, although the framework is concerned with objective features of the environment, it does not seek to characterize the external organizational environment in its entirety, as most past studies in the comprehensiveness literature have. Rather, this framework provides a way of characterizing the “organizational information environment” (Huber & Daft, 1987), a component of the task environment (Thompson, 1960). The information environment encompasses those aspects of the organizational environment that most directly affect managers’ abilities to formulate strategically relevant causal understanding.

Second, although this framework is inspired by the formal, dichotomous distinction that decision theorists have made between ambiguity and uncertainty, the framework neither presumes nor implies that managers in real-world information environments experience either pure ambiguity or pure uncertainty. Rather, the framework allows for the fact that most real-world information environments cannot be cleanly dichotomized in this way. However, it also implies that those environments can still vary such that *they may more closely approximate*

ambiguity or uncertainty. The framework I propose is intended to capture this variance as it is manifested in real-world organizational settings so that comprehensiveness scholars can apply and test theories developed with reference to the concepts of ambiguity and uncertainty in environments that approximate those conditions with greater precision than can be attained using the more general concept of environmental instability. Accordingly, this framework characterizes information environments in a way that accommodates incremental variation.

### **Characterizing the organizational information environment**

Building on prior research in information processing theory, Huber and Daft (1987) developed the concept of the “organizational information environment” to refer to the set of information about actors and events in the external environment that is available to organizations in that environment. In doing so, they argued that managers attempting to understand their environments will interact most directly with information about their environments rather than the actual environmental phenomena to which that information refers. As they put it: “It is information about the organization’s environment, as contrasted with the environment itself, that constitutes the raw material of organizational communications and actions” (p. 130). Although the information that is available to organizations in an environment may be influenced by conventionally recognized dimensions of the external environment, such as whether that environment is stable or munificent, it is also possible for information environments to vary in ways that are unrelated to these dimensions.

Huber and Daft go on to propose that the “quantity” and “ambiguity” of information available in an environment are examples of “characteristics of environmental information that affect the difficulty of information processing and use” (p. 133). In developing these ideas,

Huber and Daft were not explicitly concerned with the distinction between uncertainty and ambiguity. However, their identification of quantity and ambiguity as important dimensions of the information environment runs parallel to observations by Ellsberg (1961), an economist who theorized about the sources of ambiguity in decision situations. Ellsberg identified the quantity of information available as an important determinant of ambiguity in decision situations, observing that low quantities of information contribute to ambiguity. He further emphasized that “ambiguity may be high ... even where there is ample quantity of information, when there are questions of reliability and relevance of information, and particularly where there is *conflicting* opinion and evidence” (1961: p. 659). Thus, he identifies here several sources of ambiguity, the last of which – the existence of conflicting opinion and evidence – corresponds closely to Huber and Daft’s (1987) dimension of informational ambiguity, which they defined as “the potential for multiple interpretations of a symbol or message” (p. 133).

In the sections that follow, I integrate these identified sources of ambiguity in decision situations with Huber and Daft’s concept of the organizational information environment in order to propose two key dimensions of the organizational information environment, the “quantity” and “determinacy” of available information, that can help researchers to assess the extent to which organizations’ strategic decision making contexts more closely approximate ambiguity or uncertainty. In doing so, I proceed from the premise that uncertainty is most closely approximated by information environments that are high in both the quantity and determinacy of their information, whereas ambiguity is most closely approximated by information environments that are low on both of these dimensions. I further expect, however, that high levels of both quantity and determinacy are necessary in order for comprehensiveness to be effective. In other words, a very high level of quantity is not likely to “compensate” for a very low level of

determinacy, and neither is the reverse likely to be true. Accordingly, as Figure 2 shows, I propose that these two dimensions exert a moderating influence on the value of comprehensiveness, such that comprehensiveness is valuable only in environments with high levels of quantity and determinacy (i.e., in those that most closely approximate uncertainty). More specifically, I expect that high levels of quantity and determinacy are necessary in order for comprehensiveness to enable managers to formulate more valid understandings of the causal relationships that link strategic choices with strategic outcomes. I elaborate these arguments in the sections that follow.

\*\*\* Insert Figure 2 \*\*\*

**Dimension #1: The quantity of available information.** Most contemporary managers have enormous quantities of information available to them. But, of course, managers need specific kinds of information in order to improve their strategic understanding. The quantity of information available to managers can vary significantly from one environment to the next. For example, Miller (1993) identified six general categories of strategically relevant environmental information that firms need, one of which comprises information about competition. Information in this category that would be useful to managers in formulating an understanding of strategy-outcome linkages is likely to include information about which competitors are pursuing which strategies and how each of those competitors is performing. Information of this kind is not uniformly available across organizational environments.

For example, compare the situation of managers in a relatively concentrated industry comprised of medium- to-large, undiversified, publicly traded firms with that of managers of

small, privately-held startup companies in an emerging industry. The level of competitive information available to these two sets of managers is likely to differ significantly. Managers in the former context are likely to have at their disposal information from annual reports and publicly-filed investment-related documents, reports from independent investment analysts affiliated with brokerage houses and rating agencies, and articles from the general business press as well as others from a dedicated trade press (e.g., Kuperman, Athavale & Eisner, 2002). Managers in the latter context, on the other hand, face competitors that are not required to file publicly available documents and that may lack the level of legitimacy required to attract deep and sustained attention from journalists and analysts (Aldrich & Fiol, 1994). Thus, managers in the latter context may have difficulty even identifying their competitors. Moreover, managers in the former context are likely to share information with one another through trade associations and industry conferences (Kirby, 1988), whereas these elements of industry infrastructure may have yet to be created in the latter context (Aldrich & Fiol, 1994). Similar disparities may exist between the levels of competitive information available to managers in more economically developed countries *versus* those in less developed ones (e.g., May, Stewart & Sweo, 2000).

In order for firms to be able to improve their strategic understanding by analyzing environmental information, that information must first be available to managers. In information environments where little information is available, the level of strategic understanding that is ultimately available to firms *via* formal analysis is likely to be so low as to render decision comprehensiveness ineffective as a means of improving decision quality.

**Dimension #2: The determinacy of available information.** Even when managers have access to information, it is not a forgone conclusion that they will be able to use that information to distinguish effective strategies from ineffective ones. Environments can vary in the degree to

which the information available in them is useful in this way. One key criterion of usefulness is the determinacy of the information. Information is determinate when its meaning is clear.

Indeterminate information, by contrast, is information whose meaning is unclear because it is subject to multiple interpretations of equivalent plausibility. Indeterminate information is also sometimes called ambiguous information (e.g., Huber & Daft, 1987; Jackson & Dutton, 1988), but to avoid terminological confusion I refer to information as being more or less determinate.

It is clear that information about the relationships among organizational phenomena can be subject to multiple plausible interpretations. But information about the organizational phenomena that serve as the very “building blocks” of those relationships can have this characteristic as well. For example, a given set of firms can sometimes be plausibly categorized into multiple competitive groupings (Lant & Baum, 1995). Information environments are especially likely to give rise to multiple plausible theories about the comparative merits of alternative strategic actions when basic components of those theories are themselves subject to multiple plausible interpretations – that is, when the information itself is indeterminate.

Information environments can vary regarding the extent to which this is true.

The example of cultural industries can help to illustrate this point. One example of a factor that can cause environmental information to be more or less determinate is the degree to which it encompasses information about aesthetic judgments. Aesthetic judgments figure prominently in the operation of cultural industries. In fact, Hirsch (1972) defines cultural goods as “non-material goods directed at a public of consumers for whom they generally serve as an aesthetic or expressive, rather than clearly utilitarian function” (pp. 641-642). Strategic information about cultural goods is often highly indeterminate. For example, in order to formulate a clear understanding of the consequences of entering an existing market where



competition already exists, companies need to be able to judge the quality of their own content relative to that offered by competitors. But judgments about this very matter are very difficult to make for products with high cultural content, such as motion pictures or fashion apparel, because they involve judgments about aesthetic value that are difficult to resolve with reference to objective criteria (Postrel, 2003). As Lampel, Lant and Shamsie (2000) note, the difficulty inherent in making sense of why some cultural products are more successful than others “is rarely due to lack of data – plenty of data are usually available”; it is “because the data are susceptible to multiple and contradictory interpretations” (p. 264).

When levels of information determinacy are low, it is unlikely that managers will be able to improve their strategic understanding through comprehensiveness. Low levels of determinacy increase the likelihood that managers will generate multiple plausible theories about the causal relationships that link strategic choices with strategic outcomes. In addition, low levels of determinacy make it less likely that the collection and analysis of additional information will aid managers in choosing intelligently among those theories.

Taken together, the preceding arguments inform the following proposition:

*Proposition: The effects of comprehensiveness on decision quality will be moderated by the quantity and determinacy of environmental information; comprehensiveness is likely to increase decision quality only when the quantity and determinacy of environmental information are high.*

## **Revisiting past research**

It might be wondered whether the large body of empirical findings in the comprehensiveness literature can be used to assess the validity of this proposition. As I explained earlier, most studies in this area have not actually examined the link between comprehensiveness and decision quality but rather the more theoretically complex link between comprehensiveness and firm performance. Moreover, it is not clear that environmental instability maps cleanly onto the dimensions that I identify here. For both of these reasons, speculations about how the effects that I propose might be reflected or challenged by prior findings obtained in a study of the links among comprehensiveness, firm performance and instability would be highly tenuous.

It is somewhat more reasonable to pursue this kind of speculation in connection with the two studies in which scholars *did* study a link between comprehensiveness and decision quality. These two studies yielded contrasting findings. In the first, Dean and Sharfman (1996) found a positive link between comprehensiveness and decision effectiveness that was not moderated by instability. Although we cannot characterize the information environments of the firms in their sample with any certainty, we do know that their sample was comprised entirely of manufacturing firms, such as those involved in making steel, footwear and paint (p. 379). It is not implausible that these relatively mature manufacturing industries generally exhibited levels of informational quantity and determinacy that were high enough to render comprehensiveness valuable.

In the second study, Hough and White (2003) conducted an experiment which showed that comprehensiveness *did not* enhance decision quality in an unstable environment. The unstable environment involved having participants in a behavioral simulation solve a case that was designed to portray a business unit engaged in the

production of “optical fibers, capacitors and liquid crystal displays” (p. 484). Because the case reflected experimental manipulation, it is impossible to assess the information environment encountered by subjects in that study, but it is not implausible that the simulated information environment was characterized by relatively low levels of informational determinacy. In summary, although past empirical findings cannot be used to validate my propositions, they also do not yield any consistent pattern of evidence that would render these propositions implausible.

## CONCLUSION

Clarifying the contextual factors that affect the potential for decision comprehensiveness to improve decision quality is theoretically important, because it concerns longstanding questions that are central to strategy process research. It is practically important, too, in that many managers regard decision comprehensiveness as a recognizable and controllable set of behaviors whose costs and benefits are potentially significant and yet difficult to assess. Indeed, some variant of the theoretical relationships discussed in this article could be said to underlie the belief – or lack of belief – that many managers and researchers have in the overall value of formal strategic analysis. At the same time, the questions in this area are exceedingly difficult to study. The phenomena are complex, the relevant theoretical explanations are often subtle, and the available methodological choices are many, diverse and imperfect. It is not surprising, therefore, that the studies in this area have collectively yielded contrasting arguments, diverse findings, and new questions instead of a simple and conclusive set of answers.

I have sought to reframe the central question of the comprehensiveness literature in a way that incorporates some of the lessons that past work has to teach us. Specifically, I have raised

and addressed two problems that have hindered the progress of work in this area. These include a tendency to focus on firm performance rather than decision quality as a dependent variable and a tendency to conflate ambiguity, uncertainty and instability in predicting and interpreting moderating effects. I have also explored the implications of this last point by proposing the organizational information environment as a task-specific conception of the environment that is better suited to capturing those aspects of managers' decision making contexts that are likely to moderate the value of comprehensiveness. Finally, I have developed a proposition that elaborates an alternative moderating effect with reference to two dimensions of the organizational information environment that enable researchers to assess the extent to which managers' real-world decision making contexts more closely approximate ambiguity *versus* uncertainty. Taken together, these arguments advance the literature on comprehensiveness by making more explicit the implicit theoretical bases of its constituent arguments, identifying future empirical opportunities available to it, and strengthening its integration with the larger and older bodies of work that inform strategy process research, such as those devoted to information processing theory and behavioral theory.

## **Limitations**

In spite of the above contributions, several limitations accompany these analyses. First, by focusing on the relationships among a select group of variables, I have overlooked the influence of other contextual factors; recent theoretical work on strategic decision making has underscored the potential for decision making effectiveness to be influenced by multiple contextual considerations (e.g., Bell, Bromiley & Bryson, 1997; Rajagopalan et al, 1997). Second, I have treated the information environment as a relatively unitary, external and concrete

entity. This treatment is consistent with Huber and Daft's conception, but it also sets aside more recent critiques of that conception, such as those rooted in a more interpretive approach (e.g., Sutcliffe, 2000). Other limitations reflect the fact that I have left unaddressed other shortcomings of the focal literature, including its relatively sparse treatment of the concept of isolating mechanisms (Powell, 1992).

To some extent, these limitations reflect a perennial tension between the manifest complexities of real-world organizations and the pressures for quantitatively-oriented researchers to favor theoretical simplicity. They also reflect the fact that the necessarily slow accumulation of empirical research within a given literature stream may well unfold in parallel with the rapid development of theoretical perspectives that rival or critique that stream. This latter tension can be especially acute in large, longstanding streams of research, such as this one. These tensions impose limitations on all attempts at theoretical integration and extension of the kind I have undertaken here. In the end, however, I think the cost of these particular limitations is justified by their capacity to clarify key issues in this longstanding literature and to advance its integration with surrounding discussions.

## **Implications**

These analyses yield several implications for research. First, researchers should explore ways of measuring organizational information environments. Archival sources of data need not be the only basis for such measures; expert codings of various industries, such as those developed in the literature on managerial discretion (Hambrick & Abrahamson, 1995), may also prove useful. Second, researchers should explore ways in which comprehensiveness might interact with other firm-level moderators. For example, the existence of complementary assets,

such as the knowledge and experience of the top management team, may help some firms to improve their strategic understanding through comprehensiveness in certain contexts or to implement their decisions more effectively. Third, researchers should expand the range of industry and institutional contexts across which these questions are studied. Past studies in this area have focused almost exclusively on U.S.-based manufacturing firms, but future tests for the effects of environmental moderation are likely to be more robust to the extent that they also include high-technology firms, “knowledge-intensive” firms such as consulting firms, firms involved in the production of cultural goods and firms operating in different political and economic contexts. Fourth, researchers should explore potential complexities associated with the effects that I propose. For example, it is possible that quantity and determinacy exert moderating effects that are more fine-grained than my proposition suggests. Finally, researchers should pay more direct empirical attention to some of the surrounding theoretical questions referred to in these analyses, such as the alternative mediating processes through which comprehensiveness may influence performance as well as the issues of causality and context that complicate the link between decision quality and firm performance.

Managers can also draw insight from these analyses. Specifically, they should avoid adopting or eschewing comprehensive decision making practices solely on the basis of popular trends or the relative stability of their environments. Instead, it would be better for them to carefully consider the characteristics of their organizational information environments before increasing or decreasing the levels of comprehensiveness with which their firms make strategic decisions.

## REFERENCES

- Aldrich, H. & Fiol, C. 1994. Fools rush in? The institutional context of industry creation. *Academy of Management Review*, 19: 645-670.
- Amason, A. 1996. Distinguishing the effects of functional and dysfunctional conflict on strategic decision making: Resolving a paradox for top management teams. *Academy of Management Journal*, 123-148.
- Ansoff, I. 1965. *Corporate strategy*. New York: McGraw-Hill.
- Atuahene-Gima, K. & Li, H. 2004. Strategic decision comprehensiveness and new product development outcomes in new technology ventures. *Academy of Management Journal*, 47: 583-597.
- Becker, M. 2001. Managing dispersed knowledge: Organizational problems, managerial strategies and their effectiveness. *Journal of Management Studies*, 38: 1038-1051.
- Bell, G., Bromiley, P. & Bryson, J. 1997. Spinning a complex web: Links between strategic decision making content, process and outcome. In V. Papadakis & P. Barwise (Eds.) *Strategic decisions*. London: Kluwer.
- Bourgeois, J. & Eisenhardt, K. 1988. Strategic decision processes in high velocity environments: Four cases in the microcomputer industry. *Management Science*, 34: 816-835.
- Boyd, B. 1991. Strategic planning and financial performance: A meta-analytic review. *Journal of Management Studies*, 28: 353-374.
- Boyd, B., Dess, G. & Rasheed, A. 1993. Divergence between archival and perceptual measures of the environment: Causes and consequences. *Academy of Management Review*, 18: 202-226.
- Brown, S. & Eisenhardt, K. 1998. *Competing on the edge: Strategy as structured chaos*. Boston, MA: Harvard Business School Press.
- Camerer, C. & Weber, M. 1992. Recent developments in modeling preferences: Uncertainty and ambiguity. *Journal of Risk and Uncertainty*, 5: 325-370.
- Carlin, P. 1995. How to make a decision like a tribe. *FastCompany*, 1: 105.
- Cronin, B. 2000. What's your intuition? *FastCompany*, 38: 290.

- Courtney, H., Kirkland, J. & Viguerie, P. 1997. Strategy under uncertainty. *Harvard Business Review*, 75 (6): 66-79.
- Curley, S., Yates, J.F. & Abrams, R. 1986. Psychological sources of ambiguity avoidance. *Organizational Behavior and Human Decision Processes*, 38: 230-256.
- Curley, S. & Yates, J.F. 1985. The center and range of the probability interval as factors affecting ambiguity avoidance. *Organizational Behavior and Human Decision Processes*, 36: 273-287.
- Dean, J. & Sharfman, M. 1996. Does decision process matter? A study of strategic decision making effectiveness. *Academy of Management Journal*, 39: 368-396.
- Dean, J. & Sharfman, M. 1993. Procedural rationality in the strategic decision making process. *Journal of Management Studies*, 30: 587-610.
- Dess, G. & Beard, D. 1984. Dimensions of organizational task environments. *Administrative Science Quarterly*, 29: 52-73.
- Dooley, R. & Fryxell, G. 1999. Attaining decision quality and commitment from dissent: The moderating effects of loyalty and competence in strategic decision making teams. *Academy of Management Journal*, 42: 389-402.
- Egelhoff, W. 1991. Information processing theory and the multinational enterprise. *Journal of International Business Studies*, 22: 341-368.
- Einhorn, H. & Hogarth, R. 1986. Decision making under ambiguity. *Journal of Business*, 59: S225-250.
- Eisenhardt, K. 1989. Making fast strategic decisions in high-velocity environments. *Academy of Management Journal*, 32: 543-576.
- Ellsberg, D. 1961. Risk, ambiguity and the Savage axioms. *Quarterly Journal of Economics*, 75: 643-669.
- Fredrickson, J. 1984. The comprehensiveness of strategic decision processes: Extension, observations, future directions. *Academy of Management Journal*, 27: 445-466.
- Fredrickson, J. & Mitchell, T. 1984. Strategic decision processes: Comprehensiveness and performance in an industry with an unstable environment. *Academy of Management Journal*, 27: 399-423.
- Galbraith, J. 1977. *Organization design*. Reading, MA: Addison-Wesley.



- Glick, W., Miller, C. & Huber, G. 1993. The impact of upper echelon diversity on organizational performance. In G. Huber and W. Glick (Eds.), *Organizational change and redesign: Ideas and insights for improving performance*, pp. 176-214. New York: Oxford U. Press.
- Goll, I. & Rasheed, A. 1997. Rational decision making and firm performance: The moderating role of environment. *Strategic Management Journal*, 18: 583-591.
- Hofer, C. & Schendel, D. 1978. *Strategy formulation: Analytical concepts*. St. Paul, MN: West Publishing.
- Hambrick, D. & Abrahamson, E. 1995. Assessing managerial discretion across industries: A multimethod approach. *Academy of Management Journal*, 38: 1427-1441.
- Hambrick, D. & Finkelstein, S. 1987. Managerial discretion: A bridge between polar views on organizations. In L. Cummings and B. Staw (Eds.), *Research in Organizational Behavior*, vol. 9: 369-406. Greenwich, CT: JAI Press.
- Henderson, A. & Stern, I. 2004. Selection-based learning: The co-evolution of internal and external selection in high-velocity environments. *Administrative Science Quarterly*, 49: 39-75.
- Hirsch, P. 1972. Processing fads and fashions: An organization-set analysis of cultural industry systems. *American Journal of Sociology*, 77: 639-659.
- Hough, J. & White, M. 2003. Environmental dynamism and strategic decision-making rationality: An examination at the decision level. *Strategic Management Journal*, 24: 481-489.
- Huber, G. & Daft, R. 1987. The information environments of organizations. In F. Jablin *et al* (Eds.), *Handbook of Organizational Communication*, pp. 130-164. Newbury Park, CA: Sage Publications.
- Ireland, R.D. & Miller, C. 2004. Decision-making and firm success. *Academy of Management Executive*, 18: 8-12.
- Jackson, S. & Dutton, J. 1988. Discerning threats and opportunities. *Administrative Science Quarterly*, 33: 370-387.
- Kahn, B. & Sarin, R. 1988. Modeling ambiguity in decisions under uncertainty. *Journal of Consumer Research*, 15: 265-272.
- Kirby, A. 1988. Trade associations as information exchange mechanisms. *RAND Journal of Economics*, 29: 138-146.

- Kuperman, J., Athavale, M. & Eisner, A. 2003. Financial analysts and the media: Evolving roles and trends. *American Business Review*, 21: 74-80.
- Lampel, J., Lant, T. & Shamsie, J. 2000. Balancing act: Learning from organizing practices in cultural industries. *Organization Science*, 11: 263-269.
- Langley, A. 1989. In search of rationality: The purposes behind the use of formal analysis in organizations. *Administrative Science Quarterly*, 34: 598-631.
- Lant, T. & Baum, J. 1995. Cognitive sources of socially constructed competitive groups: Examples from the Manhattan hotel industry. In W. Scott and S. Christensen, (Eds.), *The Institutional Construction of Organizations*, pp. 15-38. Thousand Oaks, CA: Sage Publications.
- March, J. 1988. Ambiguity and accounting: The elusive link between information and decision making. *Accounting, Organizations and Society*, 12: 153-168.
- March, J. & Olsen, J. 1975. The uncertainty of the past: Organizational learning under ambiguity. *European Journal of Political Research*, 3: 147-171.
- Miller, D. & Friesen, P. 1983. Innovation in conservative and entrepreneurial firms: Two models of strategic momentum. *Strategic Management Journal*, 3: 1-25.
- Miller, K. 1993. Industry and country effects on executives' perceptions of environmental uncertainties. *Journal of International Business Studies*, 24: 693-714.
- Milliken, F. 1987. Three types of perceived uncertainty about the environment. *Academy of Management Review*, 12: 133-143.
- Mosakowski, E. 1997. Strategy making under causal ambiguity: Conceptual issues and empirical evidence. *Organization Science*, 8: 414-442.
- Papadakis, V. 1998. Strategic investment decision processes and organizational performance. *British Journal of Management*, 9: 115-132.
- Papadakis, V., Lioukas, S. & Chambers, D. 1998. Strategic decision-making processes: The role of management and context. *Strategic Management Journal*, 19: 115-147.
- Pfeffer, J. & Salancik, G. 1978. *The external control of organizations: A resource dependence perspective*. New York: Harper & Row.
- Postrel, V. 2003. *The substance of style*. New York: HarperCollins.
- Powell, T. 1992. Strategic planning as competitive advantage. *Strategic Management Journal*,

13: 551-558.

Priem, R., Rasheed, A., & Kotulic, A. 1995. Rationality in strategic decision processes, environmental dynamism and firm performance. *Journal of Management*, 21: 913-929.

- Rajagopalan, N., Rasheed, A., Datta, D. & Spreitzer, G. 1998. A multi-theoretic model of strategic decision making processes and outcomes. In V. Papadakis & P. Barwise (Eds.) *Strategic decisions*, pp. 229-250. London: Kluwer.
- Sapienza, H., Korsgaard M.A., Goulet, P. & Hoogendam J. 2000. Effects of agency risks and procedural justice on board processes in venture capital-backed firms. *Entrepreneurship & Regional Development*, 12: 331-351.
- Schoemaker, P. 1993. Multiple scenario development: Its conceptual and behavioral foundation. *Strategic Management Journal*, 14: 193-214.
- Simons, T., Pelled, L. & Smith, K. 1999. Making use of difference: Diversity, debate and decision comprehensiveness in top management teams. *Academy of Management Journal*, 42: 662-673.
- Stone, M. & Brush, C. 1996. Planning in ambiguous contexts: The dilemma of meeting needs for commitment and demands for legitimacy. *Strategic Management Journal*, 17: 633-652.
- Sutcliffe, K. 2000. Organizational environments and organizational information processing. In F. Jablin & L. Putnam (Eds.) *The new handbook of organizational communication*, pp. 197-230. Thousand Oaks, CA: Sage Publications.
- Thompson, J. 1960. Organizational management of conflict. *Administrative Science Quarterly*, 4: 389-409.
- Tushman, M. & Nadler, D. 1978. Information processing as an integrating concept in organizational design. *Academy of Management Review*, 3: 613-624.
- Wholey, D. & Brittain, J. 1989. Characterizing environmental variation. *Academy of Management Journal*, 32: 867-882.
- Zahra, S., Neubaum, D. & El-Hagrassey, G. 2002. Competitive analysis and new venture performance: Understanding the impact of strategic uncertainty and venture origin. *Entrepreneurship Theory & Practice*, 27: 1-28.

**TABLE 1.**

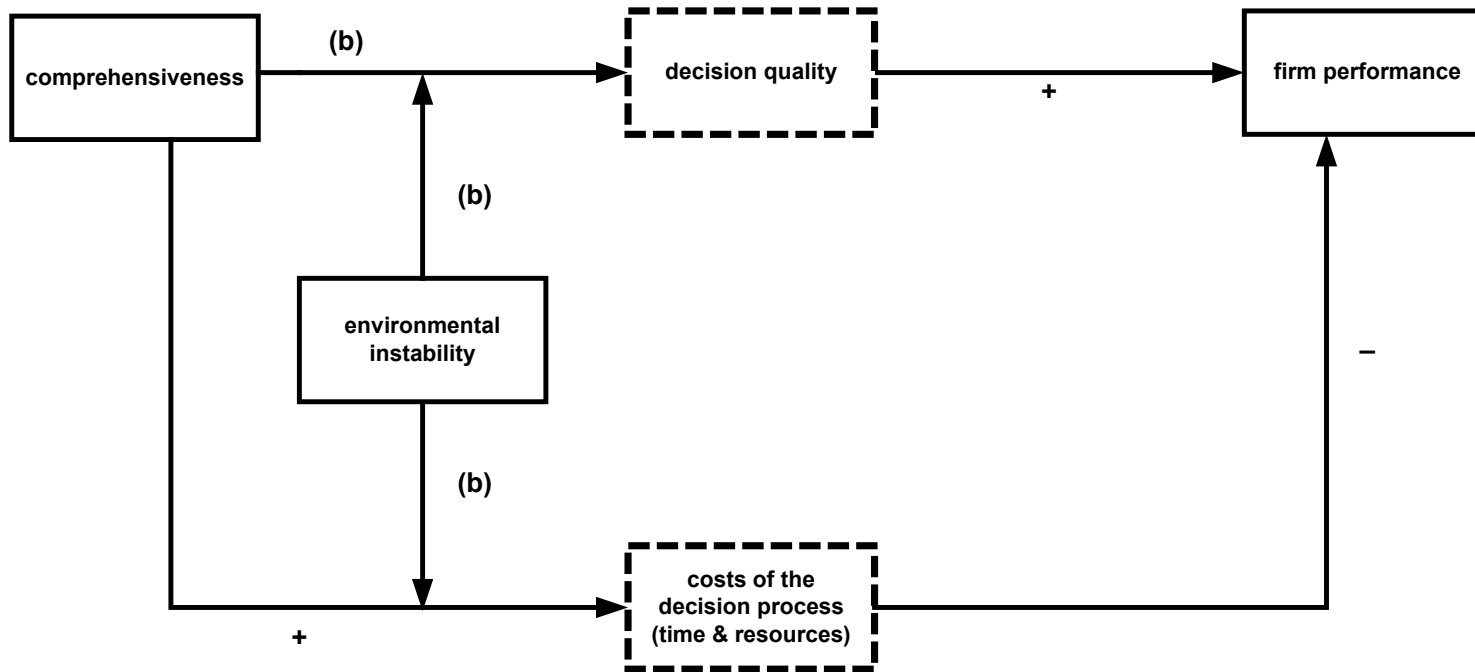
Studies in the comprehensiveness literature since 1990.

<b>Study</b>	<b>Glick, Miller &amp; Huber, 1993</b>	<b>Priem, Rasheed &amp; Kotulic, 1995</b>	<b>Dean &amp; Sharfman, 1996</b>	<b>Goll &amp; Rasheed, 1997</b>	<b>Papadakis, 1998</b>
<b>Relevant independent variable</b>	Comprehensiveness	Rationality	Rationality	Rationality	Rationality
<b>Measurement of relevant independent variable</b>	Survey scale adapted from Fredrickson scale	Survey scale based on Miller scale	Survey scale developed by the authors	Survey scale developed by one author in prior research	Survey scale adapted from Fredrickson scale
<b>Dependent variable</b>	Firm performance	Firm performance	Decision effectiveness	Firm performance	Firm performance
<b>Measurement of dependent variable</b>	Profitability; open systems effectiveness.	Return; sales growth; overall.	Assessed using subjects' own predetermined effectiveness criteria.	Return on assets; return on sales	Objective measures of return & growth; various subjective measures.
<b>Relevant moderating variable</b>	Turbulence	Dynamism	Instability	Dynamism	None
<b>Measurement of relevant moderating variable</b>	Archival measures of industry stability and predictability.	Perceptual measures based on survey scale	Archival measures of instability	Archival measures of dynamism	None
<b>Sample</b>	79 business units from multiple, unspecified industries	101 manufacturing firms	52 decisions in 24 manufacturing firms	62 manufacturing firms	70 decisions in 38 manufacturing firms
<b>Key findings</b>	Comprehensiveness enhanced profitability in more turbulent environments, but not in less turbulent ones. No relationship between comprehensiveness and open systems effectiveness.	Rationality was positively related to firm performance in high-dynamism environments, but not in moderate- or low-dynamism environments.	Procedural rationality enhanced decision effectiveness. Results did not support the hypothesis that this relationship was stronger in unstable environments.	Rationality did not significantly enhance performance. However, rationality did enhance performance in environments high in munificence and dynamism.	Rationality was positively related to most measures of performance.
<b>Perspective reflected in hypothesis</b>	Second	No formal hypothesis	First	First	Neither – unmoderated positive link proposed
<b>Perspective supported by results</b>	Partial support for first hypothesis.	First	Neither – unmoderated positive link supported	First	Neither – unmoderated positive link supported

**TABLE 1.**  
*(continued from the previous page)*

<b>Study</b>	<b>Simons, Pelled &amp; Smith, 1999</b>	<b>Zahra, Neubaum &amp; El-Hagrassey, 2002</b>	<b>Hough &amp; White, 2003</b>	<b>Atuahene-Gima &amp; Li, 2004</b>
<b>Relevant independent variable</b>	Comprehensiveness	Comprehensiveness	Rationality	Comprehensiveness
<b>Measurement of relevant independent variable</b>	Survey scale based on Miller scale	Survey scale developed by the authors	Calculated based on subjects' behaviors in an experiment	Survey scale based on Miller scale
<b>Relevant dependent variable</b>	Firm performance	Firm performance	Decision quality	New product performance
<b>Measurement of relevant dependent variable</b>	Change in profitability; change in sales.	Growth; profitability.	Calculated based on expert ratings of subjects' output.	Survey scale and archival growth rates
<b>Relevant moderating variable</b>	None	Uncertainty	Dynamism	Technology uncertainty and demand uncertainty
<b>Measurement of relevant moderating variable</b>	None	Perceptual measures based on survey scales	Experimental condition	Perceptual measures based on survey scales
<b>Sample</b>	57 manufacturing firms	228 new manufacturing ventures	400 decisions in 54 teams. (experiment)	373 new high-technology ventures
<b>Key findings</b>	Comprehensiveness partially mediated the positive interactive effects of diversity and debate on firm performance.	Comprehensiveness was positively related to firm performance. In addition, these relationships were stronger when executives experienced higher levels of perceived environmental uncertainty.	Rationality was unrelated to decision quality. But in stable environments higher quality decisions were associated with ensuring that all decision makers were well-informed.	Comprehensiveness and new product performance were positively related when perceived demand uncertainty was higher and negatively related when perceived technology uncertainty was higher.
<b>Perspective reflected in hypothesis</b>	Neither – unmoderated positive link hypothesized	First	First	Neither – hybrid approach adopted
<b>Perspective supported by results</b>	Neither – unmoderated positive link supported	First	Second	Partial support for each perspective

Figure 1.  
A model of prevailing approaches to the  
link between comprehensiveness and firm performance <sup>(a)</sup>



(a) Constructs shown in dotted-line-boxes are latent constructs. Past studies have theorized about the mediating roles of these constructs but have not typically measured them directly.

(b) The predicted directions of these relationships differ within the literature. See the text for details.

**Figure 2:**  
**A proposed model of the value of comprehensiveness**  
**as moderated by characteristics of the organizational information environment.**

