

Using Behavioral Simulations to Study Strategic Processes

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Behavioral simulations are well suited for the study of the processes that underlie strategy formulation and implementation. The authors defend this claim by describing five challenges often confronted in attempts to study strategic processes: (a) measuring variables at multiple levels of analysis, (b) controlling or measuring the context, (c) dealing with history effects, (d) capturing process differences across issues, and (e) linking processes to outcomes. The article describes seven behavioral simulations that are currently available and then discusses the capacity of behavioral simulations for addressing the challenges facing strategic processes researchers. Theoretical and research choice points for selecting among behavioral simulations are identified along with the implications of using behavioral simulations in studies of strategic processes. Limitations of behavioral simulations are also discussed.

KEYWORDS: *behavioral simulations; strategic processes.*

Researchers interested in the *processes* that underlie strategy formulation and implementation are continually challenged to locate a satisfactory setting and method for their studies. Examples of the processes most commonly examined in strategy research are problem finding and identification, agenda building, influencing others, coalition formation, and decision making. They illustrate the cognitive, social, organizational, and political processes that Bower and Doz (1979) argued underpin strategy formulation and implementation. These processes collectively build the patterns of action that become an organization's realized strategy.

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There are several reasons why researchers of strategic processes are at a disadvantage in finding appropriate research settings and methods. First, they frequently want to measure the variables of interest at multiple levels of analysis. Bower (1970), Burgelman (1983), and Quinn (1980) each demonstrated that the processes that produce strategic action involve individual, unit, and corporate-level action. Studies that look at only one level of analysis are likely to inadvertently reach conclusions about strategic processes that appear logical at one level of analysis but are imprecise or inaccurate at another. Because of their multilevel nature, strategic formulation and implementation processes are often difficult to observe in real-life settings. A simulated context, while limited in certain ways, provides a unique opportunity to observe the unfolding of processes at the individual and collective levels of analyses. The opportunity to observe these processes in finer detail in a simulated context enhances researchers' ability to develop and refine hypotheses that acknowledge the embeddedness of social processes that create patterns of strategic action in organizations (Pettigrew, 1987).¹

Second, researchers need a setting and research method that allows for the control and/or measurement of contextual factors, such as organizational structure, climate, and power relationships. Research has found that the environmental and organizational context does alter the form and direction of strategic processes (e.g., Pettigrew, 1973). If research on strategic processes is to lead to a body of knowledge that can be used to manage organizations more effectively, critical contextual variables must be identified and measured in each study of strategic process.

The third challenge that researchers face is that strategic processes may be historically constrained—initiatives for strategic action can be bound to past ways of doing things. For example, Selznick (1949) and Clark (1972) showed how the ideology of an organization established at the organization's founding constrains subsequent directions of strategic change. It would be useful to have a research method that illuminated these historical effects by making them more transparent and therefore more researchable.

To develop meaningful generalizations from process research, one needs a method that permits the comparison of processes across different types of issues. Strategic processes have been found to vary by type of issue (e.g., problem or opportunity; see Dutton & Jackson, 1987; Fredrickson, 1983, 1985; Nutt, 1984). Thus the fourth challenge is in identifying research settings and methods that facilitate the measurement of issue-specific variables, thereby allowing researchers to explore how strategic processes vary as a function of the type of issue confronted. When no differences are

observed, generalizations can be made with some degree of assurance; when differences are significant, hypotheses can be refined and the theory underlying the research can be enhanced to reflect the new process insights.

A fifth challenge in the study of strategic processes involves linking the process variables assessed to the outcomes achieved. This may include an examination of how the skills exhibited by the managers facilitate or inhibit unit and organizational outcomes (Stumpf, 1988b). An ongoing problem with most process search is its inability to link the process variables of interest with meaningful outcome variables. The result is that while we enhance our understanding of processes we fail to develop empirically supported guidelines for more effective strategic management. Thus the setting and method should allow for the measurement of issue-specific and organizational actions in order to address the question of how differences in strategic processes relate to different types of outcomes.

This article documents the potential and initial success of behavioral simulations in addressing these five challenges. It describes seven different simulations that are currently available based on a series of research measures and contextual variables. Where possible, concrete examples of how behavioral simulations have been used to test propositions about strategic processes are provided. We conclude with a discussion of limitations facing researchers interested in applying behavioral simulations to the study of strategic processes.

What Is a Behavioral Simulation?

Simulations attempt to reproduce a setting and issues that are typical of some context or situation. They do this by immersing a group of individuals into a simulated, life-like context for a specified time period. "A simulated experimental environment is a simplified and continued situation that contains enough versimilitude or illusion of reality to induce real world-like responses by those participating in the exercise" (Keys & Wolfe, 1990, p. 308). Behavioral simulations stand apart from computer simulations in that they attempt to reproduce individual and collective behaviors that would normally be observed in a real-world environment (Stumpf, 1988a). The types of behavioral simulations discussed here are ones that attempt to mirror top management interactions in an organization. Stumpf (1988a) referred to this type of business simulation as a large-scale behavioral simulation to distinguish it from computer simulations and other experience-based activities

such as role-plays, experiential exercises, assessment center exercises, small group activities, and individual in-basket exercises.

The reality of the organizational setting in a behavioral simulation is created through the use of extensive background information and in-baskets for each simulated top management role that are interconnected to reflect organizational realities. This creates the possibility of dynamic interactions among participants over the duration of the simulation. As noted by Keys and Wolfe (1990), the fact that the simulation encourages realistic reporting relationships and contains roles that have specialized information contributes to the complexity and validity of these simulations as organizational contexts. The content of in-baskets as well as the total organizational design are based on actual data and events collected from ongoing organizations.

A wide range of individuals participate in behavioral simulations, often as part of a voluntary management development program lasting anywhere from 3 days to 2 weeks. For example, Stumpf and Dunbar (in press) reported that their sample consisted of 192 middle-to senior-level managers attending a public offering of an executive development program focusing on strategic management, 126 new managerial employees hired into a fast-track management training program by a large national bank, 64 financial analysts and other financial specialists attending an executive MBA program, and 35 senior managers of a mid-sized regional bank. All participants were employed full time at the time of participation. Over 100 different corporations had funded these participants, representing a wide range of industries. The average age of the participants was 40 years; the average number of years of work experience was 10.6. In addition to managers as participants, we have also used students in our research as they participate in the simulations as part of their business policy course requirements.

In each simulation, participants are given a choice of several roles that vary in terms of hierarchical position, product or functional responsibilities, issues to be addressed, and status. These roles and their reporting relationships create the organizational structure. For example, in the Foodcorp simulation, there are 13 roles which include the President, Senior Vice President (SVP) Finance, Chief Operating Officer, Senior Vice President (SVP) Dry Goods Group, and so on (see Figure 1). Seven behavioral simulations are described in the following section. Key attributes that distinguish each context are also summarized in Tables 1 and 2 that follow.

Foodcorp INTERNATIONAL

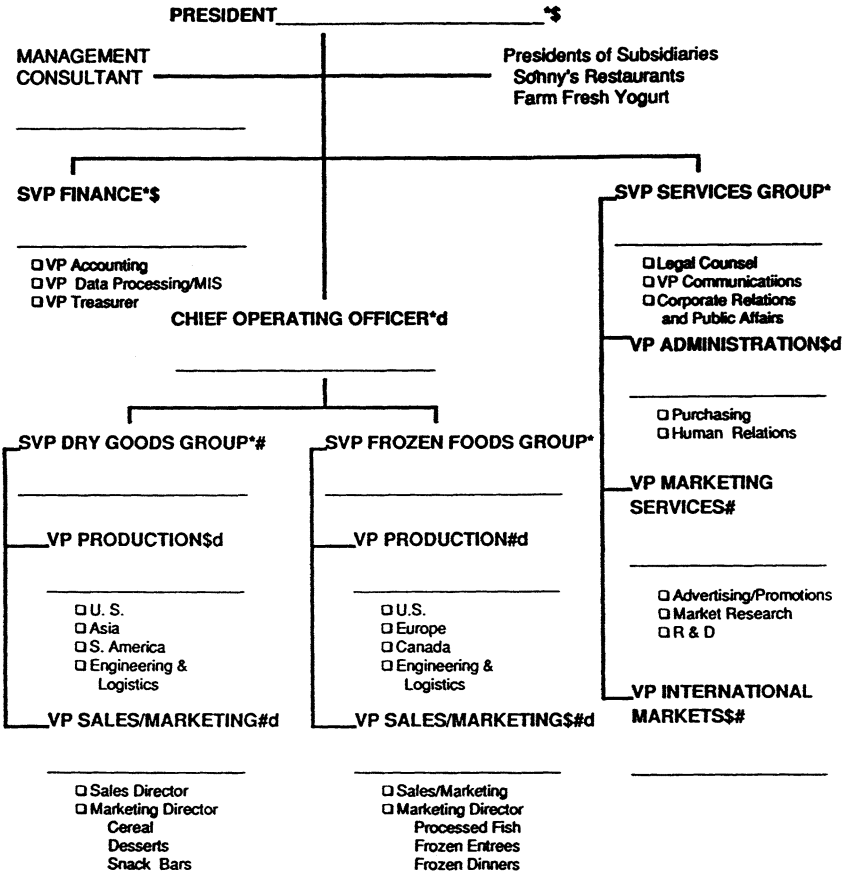


Figure 1: Foodcorp Organization Chart

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NOTE: Role titles shown in bold type are filled by participants in the Foodcorp simulation. * = Executive Committee, \$ = Acquisitions Committee, # = New Business Development Committee, and d = Distribution Systems Task Force.

The Seven Simulations

Foodcorp International

Foodcorp International, a food manufacturing organization, simulates 13 senior management roles, three levels of hierarchy, two product groups, and two subsidiaries (Sonny's-Restaurants and Farm Fresh Yogurt). Foodcorp's products (dry goods and frozen foods) are sold to distributors and retail supermarkets throughout the United States and in 60 other countries through 30 manufacturing plants, 15 marketing affiliates, seven licenses, and six regional export sales organizations. Foodcorp is a fairly large firm within its industry with 25,000 employees and \$2.7 billion in sales.

Foodcorp uses a matrix organizational structure and has several committees to augment this structure (see Figure 1). New product development activity, internal corporate venturing, and diversification/consolidation activities are integral to Foodcorp and the food processing industry. Consumer marketing (including brand development and advertising) and production quality are key issues domestically and internationally.

Looking Glass, Inc. (LGI)

LGI is a glass manufacturing company that simulates 20 senior management roles, four levels of hierarchy, and three product divisions. Its eight product lines extend from conventional lightbulb casings to high-tech optical fibers. All products are manufactured by LGI and sold to other organizations, not individual consumers or distributors. LGI is a mid-sized, national firm with 4,000 employees and \$200 million in sales.

The three product divisions of LGI (Commercial Glass, Industrial Glass, and Advanced Products) experience substantially different market environments (stable, moderately uncertain, and uncertain). While several issues and capital expansion proposals require collaboration among the divisions, each division functions separately. Key issues relate to interdivision rivalry, hierarchical relationships, and the management of a diversified portfolio of products.

Globalcorp

Globalcorp is a diversified international conglomerate of \$27 billion in assets. Each of its 13 senior management roles has corporate strategy development and business portfolio management responsibilities. The banking services sector is composed of a consumer banking group, business and personal group, and

consumer credit group. The advisory services sector includes a management consulting group and a travel services group. The investment services sector comprises an insurance group, broker/dealer group, and capital markets group. Each group has two or three lines of business that offer a full array of products or services and has profit-center responsibility.

Unlike the autonomous divisional activity common to LGI, Globalcorp involves active coordination and competition across lines of business. The three levels of Globalcorp's hierarchy are augmented by a committee structure that encourages cross-sector and cross-business discussion of new business ventures, acquisitions, mergers, divestitures, and strategic direction.

Metrobank

Metrobank is one of three simulated companies in the financial services industry (the other two, Investcorp and Landmark Insurance Company, are discussed shortly). These simulations each have 12 or 13 senior management positions across three levels of hierarchy and two major product-service areas (individual and corporate/institutional services). These financial service firms can be used separately, in multiples, and in various combinations. Several key issues in each simulation are linked to the other two simulations. For example, the data processing problems in Metrobank might be resolved by subcontracting them to Investcorp.

Metrobank is part of Metrobank Holding Company, which includes a regional bank with \$1.5 billion in assets and a medium-sized regional finance company, Leading Finance, offering mortgages and installment loans. Business activities include savings and loan products for consumers, commercial lending, and corporate banking.

As a bank, Metrobank confronts a variety of regulatory constraints to its market initiatives as well as a rapidly intensifying competitive environment. Key issues include merger and acquisition activity (which is common within the industry), as well as rapid technological improvements in operations, data processing, and delivery systems. Questions of customer service, cross-selling products to customers, responding to changing competitive pressures, target marketing, and the consistency of business goals and participant actions are particularly salient.

Investcorp

Investcorp is part of Investcorp Holding Company, which includes a large securities firm with \$108 million in capital and a regional life insurance

company, Rolley Insurance. Services offered range from investment banking to retail and institutional sales of stocks, bonds, options, and so on to specialized customer services. The three selling entities of Investcorp (capital markets, institutional sales, and retail sales) experience different customers, markets, and competitors, implying that they need to collaborate extensively on a day-by-day basis to reduce financial risk.

The securities industry is highly time and transaction oriented. Minutes in the trading area can mean thousands of dollars in profits or losses. Participants must ensure that Investcorp is organized and operationally ready for this challenge. Key issues include the level of support for new product introductions, maintaining a rapid and flexible response to the marketplace, effective internal coordination and control, and taking business actions consistent with the firm's goals.

Landmark Insurance Company

Landmark is among the top 20 mutual life insurance companies in the United States. Operated for the benefit of its more than 1 million policyholders, Landmark has assets of over \$15 billion, life insurance in force of over \$69 billion, and paid dividends and benefits of over \$2.17 billion last year. The services offered range from individual insurance and investment products to group life and health insurance to group pension plans. Landmark-affiliated companies include a realty management company, a securities firm, and a research services firm.

As a mutual life insurance company, Landmark's goals may differ from companies owned by stockholders since Landmark's responsibilities are to its policyholders. Long-term stability in a rapidly changing environment is essential for insurance companies. This raises issues of how to effectively respond to changes within the industry that seem to demand new products and services, more diversification in business activity, and new channels of distribution. Landmark has a matrixed committee structure within its formal hierarchical structure to address these issues directly.

Northwood Arts Center

The Northwood Arts Center (NAC) is a not-for-profit arts organization composed of three units: the Crandall Museum, the New Horizons Theater, and NAC staff and support services. NAC's expenses last year exceeded \$3 million, leaving a shortfall of \$31,000. NAC is managed by seven directors. The Crandall Museum has over 2,500 members and 100,000 visitors each

year. New Horizons has about 14,000 subscribers and 116,000 customers annually.

As with most not-for-profits, NAC has many constituencies that it must satisfy, each placing different demands on what NAC does. On the funding side, the state, local, and federal government grants, as well as charitable contributions, often have strings attached. For earned income, different consumers want different types of performances and different art forms displayed. Community groups want to influence NAC's activities to support their concerns. Board members often have their own views of what performance should be done — and these members are often art donors and financial supporters of NAC. Key issues involve accommodating diverse constituencies, establishing a viable programming policy, profit goals for a not-for-profit organization, and organizational culture and values.

The “Real” and the “Unreal” in Behavioral Simulations

One of the simulation's attributes that makes it “life-like” to participants is the presence of a formal hierarchy and division of labor which constrain communication and interaction patterns in ways that mirror “real” organizational contexts. Several other characteristics that enhance the real-life quality of the simulation include (a) the existence of various standing committees; (b) several prescheduled committee meetings that can be attended, rescheduled, or ignored by the participants; and (c) the incoming and outgoing mail throughout the simulation that is created by the participants as they attend to or ignore various issues. The large number of issues contained in a behavioral simulation (typically 15 or more major issues and 30 or more minor ones, with each role confronting 6 or more major issues and 10 or so minor ones) make it a rich information environment and context in which to manage. Rarely does a participant attend to more than half of the issues that they might want to if they were given unlimited time to participate in the simulation. As a result, the simulation provides an ideal context for studying the processes that determine what issues claim management's attention and what issues are ignored.

The materials given to participants in the simulation mirror real organizational experiences:

Prior to the simulation experience, participants are assigned an organizational title, an associated salary, and role responsibilities. They are given a corporate annual report, an organizational chart and information describing the functions performed by other role holders including their superiors and subordinates. On

arriving at the simulation, participants are provided with offices, desks, meeting rooms, phones, and writing materials. As an initial structure to their work day, they receive schedules of meetings, agendas of issues, budget reports and memos containing information about current and unsolved problems. In addition, mail pick-ups and deliveries are scheduled throughout the day. All of these organizational trappings are designed to encourage a belief in the simulation as a real and valid experience. (Dunbar, Stumpf, Mullen, Hartman, & Berliner, 1985, p. 4)

Behavioral simulations attempt to control for demand characteristics by making the stimulus material as familiar and realistic as possible. People experience performance "demand characteristics" as part of their normal work activities. Hence all such demand characteristics per se are not a threat to the internal validity of the research being conducted. The challenge that behavioral simulations try to meet is to create a set of demand characteristics comparable to real strategic decision situations within the context of the simulation experience. The nature of the materials (e.g., memos, not cases), the facility (offices, not classrooms), and the organizational setting (company that is familiar and feels real, not a widget manufacturer) help to reduce the obtrusiveness of the simulation. The amount of uninterrupted time provided permits participants to forget about some of the artificiality of a simulation and begin to treat it as real. Our observations support this for 8 out of 10 participants. Participant feedback also indicates that most participants forget about it being a simulation and believe that they acted as they would in similar strategic decision situations.

The simulations begin with an open-ended task. Simulation participants are asked to run the organization as they see fit. The use of an "open ended task" to begin the day is to reduce the demand effects that participants might feel due to the observational process. Since the training staff have not shared how they think the firm should be managed, this positioning reduces the likelihood that participants will try to manage in a manner that conforms to the training staff's expectations. Such positioning is intended to encourage participants to do what they think is best, based on their past experiences, personal style, and skills in dealing with strategic issues. It is their personal "history" that we expect subsequently constrains their behaviors and thereby makes the observations particularly relevant. At the same time, the open-endedness of the task creates more ambiguity for top decision makers than would be present in an organization where past investments and future expectations constrain strategic options. The net effect of the open-ended task is to create a type of "clean slate" effect, where the assumptions, experiences,

styles, and skills of participants become more visible (and researchable) as the simulated day unfolds.

The simulation typically concludes after 6 hours with an address by the president to the other employees. What issues are explored or ignored, who gets involved in decision making, how formal power is used, what climate emerges and how it affects the participants, and what actions are taken or not taken are free to emerge from the participants within the context of the simulation. While an organizational structure exists and some meetings are preplanned, participants are free to alter these built-in constraints. Although each role is initially constrained by the content of the information in it (e.g., data in memos, annual reports, and job descriptions), there are no constraints on how individuals interact, with whom they communicate to get additional information, or how such information is interpreted, shared, or used. The challenge for strategic process research is to capture and examine the cognitive and interactive processes that become part of the simulated organization, and to use these observations to explain outcomes (e.g., patterns of decisions and organizational financial performance).

While there are several dimensions of behavioral simulations that make them realistic, there are also limits on the degree to which simulations re-create "real" top management behavior. First, the assignment of individuals to roles is seldom random, meaning that participants' self-selection of roles limits research conclusions based on role differences. While individuals generally choose their roles in behavioral simulations, the process by which they choose is substantially different than in actual organizations. This does create some limitations on the generalizability of results for a particular role. We have dealt with this issue in some research studies where it is believed to be an important contaminant by partialing out the effect of role across multiple runs of the same simulation. In such research studies, we suggest treating the role-specific variance as error variance.

Second, the simulation's time frame creates a sense of urgency and time pressure that may surpass normal levels for top managers in an organization. Participants' lack of experience with the role, organizational, and institutional contexts further magnify participants' stress levels. While the level of arousal induced in participants by both the novelty of the context and an artificially constrained time frame may exaggerate stress-based reactions for observing processes and behavior, these conditions may be ideal for some research questions. Studies of individuals under stress suggest that when under stress, individuals (and groups and organizations as well; Staw, Sandelands, & Dutton, 1981) elicit their most well-learned or dominant response (Zajonc,

1965), which is built from past behavioral patterns. Such a dominant response bias may draw to the surface exactly those behaviors which researchers or educators wish to study. In essence, the heightened time pressures help to make behavior more habitual and natural, inducing individuals to exhibit behaviors that "come naturally."

Behavioral Simulations and the Challenges of Studying Strategic Processes

At the beginning of this article, we cited five challenges to the study of strategic processes: its multilevel nature, its context dependence, its linkage to history, its issue specificity, and the importance of linking the process and the management skills exhibited to outcomes. Behavioral simulations are well suited to address these challenges. The bases for this claim are described as follows.

Measurement at Multiple Levels of Analysis

Behavioral simulations allow for the simultaneous measurement of variables at the issue, individual, unit, and organizational level. Standardized questionnaires administered to participants at the end of the simulation measure a large set of variables. The variables that are measured systematically in each of the simulations are summarized in Table 1.

As the listing in Table 1 suggests, the variables that are collected regularly in the simulation afford many possible avenues for explaining how, when, and what strategic processes unfold in an organization. For example, one might study how the power and climate that arise among the total top management team (measured at the organizational level) or within various subunits (measured at the subunit level) affect the choice of various strategic goals (organizational level) and perceived individual effectiveness (individual level). Alternatively, one might wish to examine how an individual-level variable, such as strategic management skills exhibited, affects the strategic goals that are selected (organizational variable) or the degree of congruence between organizational actions and goals (organizational variable). As these examples illustrate, the simulation is ideally suited to examine these cross-level or multilevel relationships that help to create patterns of strategic processes in organizations.

While questionnaires represent one means of measuring variables at different levels of analysis, researchers can also use the memos written during

TABLE 1: Research Measures Used in Behavioral Simulations

	<i>Foodcorp International</i>	<i>Looking Glass Inc. (LGI)</i>	<i>Global-corp</i>	<i>Metro-bank</i>	<i>Invest-corp</i>	<i>Landmark Insurance Company</i>	<i>Northwood Arts Center (NAC)</i>
Organizational research measures ^a							
Financial performance	Yes	Only for 13 capital actions	Yes	Yes	Yes	Yes	No
Organizational goals	Yes	No	Yes	Yes	Yes	Yes	Yes
Goals/actions consistency	Yes, but limited	No	Yes, but limited	Yes	Yes	Yes	Yes, but limited
Internal and external venturing	Yes	No	Yes	Yes, but limited	Yes, but limited	Yes	No
Organizational climate	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Basis for power	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual research measures ^b							
Perceived organizational priorities	No	Yes	No	Yes	Yes	Yes	Yes
Perceived contributions made by others	No	No	No	Yes	Yes	Yes	No
Strategic management skills exhibited	Yes	No	Yes	No	No	No	Yes
Peer and self-assessment of overall effectiveness	No	Yes	No	Yes	Yes	Yes	No
Participant knowledge of business and markets	Yes	Yes	Yes	Yes, but limited	Yes, but limited	Yes, but limited	No

a. Each of the simulations requires the participants to complete a lengthy questionnaire that provides research data on the number and “perceived effectiveness” of actions taken and organizational climate. The set of the most commonly taken actions have also been evaluated by industry and content experts to provide an “objective” index of effectiveness. Staff observers (generally 1 of every 6 participants) routinely collect collateral measures as a function of the research interest of the sponsoring organization.

b. Each simulation incorporates a measure of peer perceptions of each other’s power and influence skills.

a simulation and the frequency and content of communications and interpersonal contact to examine variables relevant to strategic processes. These activities, which can be observed by a trained staff person and/or videotaped during the simulation, create traces and patterns that can be subsequently analyzed (Webb, Campbell, Schwartz, & Sechrest, 1966). For example, one study of differences in patterns of participant interest around different types of strategic issues explicitly tested whether interest and issue perceptions varied across different types of environmental contexts. To confirm that contexts varied in levels of uncertainty, the researchers compared the frequency of telephone calls and memos written across the three different divisions in the LGI simulation as a check on whether participants experienced different levels of informational uncertainty (Dutton & Webster, 1988). While the trace measures were not used as evidence of process *per se*, they were used to validate and confirm the designed contrasts built into the simulation (e.g., contrasts across units).

Control Over Context

Behavioral simulations allow the researcher to control the context in studies of strategic processes in three distinct ways. First, as noted in Table 1, several individual and organizational variables are measured systematically after each simulation. For example, systematic data are collected on perceived sources of individual influence (Dunbar & Ginsberg, 1987) and organizational climate (Taylor & Bowers, 1972). Measures of these contextual variables could be correlated with decision process measures, such as the number or frequency of interrupts (Mintzberg, Raisinghini, & Theoret, 1976) or the amount of time a decision takes (Hickson, Butler, Cray, Mallory, & Wilson, 1986).

A second approach for capturing the link between context and process emerges from taking advantage of contextual contrasts that are built within the simulations. Within most of the behavioral simulations, different units or divisions represent contrasts in levels of task uncertainty, diversity of markets faced, and past financial performance. For example, in Foodcorp, the Dry Goods Group is an old line of business that is now confronting major competitor initiatives in the United States after years of experiencing a stable, predictable environment. The Frozen Foods Group, which had been experiencing a fast-growth and rapidly changing environment, is now confronting a decrease in the rate of change as its industry segment matures. Assuming that these unit contrasts represent differences in a contextual variable of interest, the strategic processes can be compared across units.

One such study compared the patterns of interest that formed around issues in three units within LGI (Dutton & Webster, 1988). These contrasts were designed to examine whether or not individuals who were working in units facing varying degrees of environmental uncertainty were motivated differently to invest in strategic issues. For example, in the LGI simulation, the three major product divisions (Commercial Glass, Industrial Glass, and Advanced Products) were originally designed to represent contrasts in the rate of change and complexity present in a division's market environments. Dutton and Webster (1988) hypothesized and found support for the idea that these contrasting market environments would affect patterns of decision makers' interest in strategic issues. The results of the empirical analyses (based on a sample that included middle-level managers from a mid-sized information services firm and students participating in an upper-level business policy course), suggest that in divisions characterized by greater levels of uncertainty, decision makers are more reluctant to get involved in strategic issues (as evidenced by smaller, less diverse coalitions formed around issues in these types of contexts).

The third way in which a researcher can control context is to contrast the attributes of different simulations. Several contrasts are possible by comparisons across rather than within each simulation. These contrasts are highlighted by the summary descriptions of the industry and organizational contexts for each simulation in Table 2. Reflected in these simulations are differences in business focus (including international versus domestic, manufacturing versus service, profit versus not-for-profit, and the product offering within an industry), organizational structure, levels of hierarchy, depth and extent of information provided, environmental context, whether or not a corporate vision and goals are articulated, and the percentage of corporate-level issues compared to total issues.

The Effects of History Are Minimized

Researchers studying the evolution of an organization's strategy over time consistently reveal that current goals, product strategies, and change initiatives are strongly bound to "the past way of doing things" (Quinn, 1980). Theories of incremental strategic processes (Lindbloom, 1954) suggest that strategic change evolves in "little fits and starts" because historical knowledge, rules and procedures, and political alignments constrain the degree of new knowledge or new behaviors that an organization elicits or permits. As a result, the processes observed in an organization are generally best understood against a historical backdrop.

TABLE 2: Comparisons Among Behavioral Simulations

<i>Simulation</i>	<i>Business Focus</i>	<i>Organizational Structure</i>	<i>Levels of Hierarchy</i>	<i>Depth/Extent of Information</i>	<i>Environmental Context in Years</i>	<i>Corporate Vision/Goals Articulated</i>	<i>Percentage Corporate-Level Issues</i>
Foodcorp International	International marketing and manufacturing	2 product groups, 1 staff group, 4 committees, 13 roles	3	Moderate	1990s	Yes	40
Looking Glass Inc. (LGI)	Industrial manufacturing and sales	3 product divisions, functionally organized, 20 roles	4	Moderate to light	1970s	No	15
Globalcorp	International financial and advisory services	3 business sectors, 3 committees, 13 roles	3	Very heavy	1990s	Optional	70
Metrobank	Consumer and corporate banking	2 product groups, 1 staff group, 2 committees, 12 roles	3	Heavy	1980s	No	33
Investcorp	Securities-brokerage and investment banking	2 product groups, 1 staff group, 2 committees, 13 roles	3	Moderate to heavy	1980s	No	33
Landmark Insurance Company	Group and individual life/health insurance (mutual)	2 product groups, 3 staff groups, 3 committees, 13 roles	3	Moderate to heavy	1980s	Optional	40
Northwood Arts Center (NAC)	Visual and performing arts	2 artistic units, 1 staff group, 7 roles	2	Moderate to light	1990s	Optional	50

While historical influences are important, one advantage of behavioral simulations as a method for studying strategic processes is that the effects of history can be minimized or magnified, depending on the goals of the research. Every group of individuals who participate in the simulation starts at the same point in the historical clock of the simulated organization. The background data provided on the firm are the same for each use (e.g., past performance, how the firm was founded, major shifts in strategy since founding, and so on). Participants bring their own personal history (e.g., perspectives and biases) and corporate histories (how to get things done, how things were done in the past) to the simulation. By holding the simulation history constant, more of the behaviors exhibited are likely to reflect the participants' personal and corporate histories in action. While history effects can never be completely eliminated in a behavioral simulation of this type, a common starting point reduces the relationship of history to the substance and form of the strategic process that evolves. By minimizing historical effects, simulations can make more transparent the effects of other variables on strategic processes and outcomes.

Alternatively, researchers may wish to explicitly study how an organization's history (e.g., its performance record and founder characteristics) affect strategic processes. In this case, it would be important to select participants from the same organizational context and observe how they manage processes, given the same "raw material." Individual's experiences with a particular organization socializes them to values, beliefs, and norms that are traces of an organization's history, which are brought into and become quite apparent in an organizational setting. For example, after working several years with behavioral simulations run by participants who are all from a single organization, one gets a strong sense of how processes evolve and individuals interact in a "Citibank" versus a "Dow Jones" organization. Thus the chance to observe simulations run by individuals who all work for the same organization provides an opportunity to more readily observe how an organization's history (as manifest in routines and culture, for example) form and constrain the direction and outcomes of strategic processes.

In fact, Segev (1987) noted a similar advantage for using simulations as a research tool with respect to the level of control it allows over the external environment. One of the major advantages he cited for use of simulations as a research tool is "the common and controlled external environment provided for all firms," thus permitting "the analysis of differences in strategic variables in organizational contexts, unhindered by uncontrollable external environmental influences" (p. 574). Thus while the second point noted the advantage of designing contrasts in contexts to assess its influence on

strategic processes, the point here is that important features of the historical and environmental contexts can be magnified or depressed through the selection of participants who are from identical or similar organizational contexts.

Process at the Issue Level

Measurement of key variables at the issue level is particularly important for studies of strategic processes, such as decision making, agenda building, and coalition formation. Research has shown that strategic processes are sensitive to issue characteristics. For example, Nutt's (1984) study of 78 decision processes showed that problem-evoked, crisis-evoked, and opportunity-evoked decision processes generated different decision behaviors (e.g., different information search behaviors and different levels of decision participation) and thus different process characteristics. Different types of issues pose different informational demands and raise different political stakes for organizational participants, which, in turn, activate different strategic processes. Behavioral simulations are well suited to study issue-based differences because each simulation contains a broad issue sample from which a subset of issues can be selected, separately analyzed, and relevant processes compared. The types of issues embedded in each simulation are alluded to in the earlier brief descriptions. Each simulation contains a broad array of issues described in detail in the respective trainer manuals. The issues range from strategic to tactical, technical to social, complex to simple, interrelated to independent, and concrete to abstract.

Researchers have many choices in how to study differences in strategic processes by issue type. One option involves selecting a subset of issues from different units or simulations that represent contrasts in the issue-level variables of interest. For example, in one study of how the perceptions of issues related to the allocation of resources to issues (e.g., time and monetary allocations), Dutton, Stumpf, and Wagner (1990) selected a set of eight issues to study in the Metrobank and Investcorp simulations. The issues were selected to represent contrasts in the level of urgency associated with the issue and the feasibility of issue resolution. These dimensions were chosen as selection criteria because of their hypothesized importance in strategic issue diagnosis (Dutton & Duncan, 1987). Data to test the relationships between issue perceptions and the allocation of individual and organizational resources were collected via a questionnaire administered at the end of each simulation. The sample for the study involved students in a capstone business policy course and middle-level managers from a large chemical manufactur-

ing organization. The research results indicate that the way that issues are interpreted relates strongly to what type and what amount of resources decision makers are willing to invest in them. For example, this study demonstrated that the more interdependent decision makers perceived an issue to be with other issues, the more time and budgetary resources they were willing to invest in it.

Another option to study issue-level processing involves comparisons of strategic processes *across* simulations. For example, Globalcorp contains the greatest number of corporate-level strategic issues. Participants in this simulation spend a greater amount of their time wrestling with what businesses the company ought to be in, as opposed to questions about what product strategies are best suited for the firm. For example, if one observed the use of richer communication media (Daft & Lengel, 1984) in Globalcorp as opposed to Metrobank, one could relate this finding to the population of strategic issues that participants face in these two simulations.

Another option for analyzing process differences across issues is to compare relationships between variables across the simulations. For example, Dutton, Stumpf, and Wagner (1989) examined the relationship between issue interpretations and resource allocations. The relationships between these two sets of variables were compared across a financial services and manufacturing context. The comparison revealed several contrasts. For example, in the Metrobank and Investcorp simulations (the financial services context), an issue's perceived interdependence with other issues was strongly and positively related to other issue judgments, such as an issue's urgency and feasibility. In contrast, using the same measures in the LGI simulation (the manufacturing context) revealed that an issue's perceived interdependence with other issues was unrelated to other issue judgments. One interpretation of this finding was that in more uncertain environmental contexts (simulated by Metrobank and Investcorp), an issue's perceived interdependence cannot be assessed independently of other issue judgments. Thus the model for issue diagnosis may vary, depending on informational characteristics of the larger environmental context.

Linking Strategic Processes to Action

The final challenge to a method for studying strategic processes involves the opportunity to link these processes to action. Using the research discussed earlier, a relevant question might be: What differences do strategic issue diagnosis and resource allocations to issues imply for organizational-level action? The behavioral simulations afford several options for the measure-

ment of organizational action, which in turn, become the outcome measures that can be linked to process characteristics and the skills of the managers involved.

One option is to measure the radicalness of strategic action exhibited in a particular simulated organization. By radicalness of action we mean the magnitude and scope of organizational change implied by the actions taken. More radical action implies that the actions reported as made by key decision makers in a simulation company would result in broad and costly organizational changes. Organizational and strategic management theorists express substantial interest in this dimension for describing change (e.g., Normann, 1971; Tushman & Romanelli, 1985). Behavioral simulations afford the possibility of relating how characteristics of strategic processes affect the radicalness of change. For example, do organizations in which issues are more likely to be defined as threats as opposed to opportunities initiate more radical change (Dutton & Jackson, 1987)? Do organizations which consider multiple issues simultaneously, even when the issues are very different from one another (i.e., a large, varied organizational agenda; Dutton, 1986) initiate more radical change? Both of these questions illustrate the possibility of linking processes (issue interpretation and agenda building) to characteristics of organizational action.

There is also the possibility of linking strategic processes to financial performance. The financial performance of a simulated company is generally determined by examining the financial impact of each major issue. By computing such indices as capital expenditures, operating costs, estimated profits, total assets, and total liabilities across all actions taken, a simplified balance sheet and income statement can be produced from each simulation. Researchers can explore the impact of such processes as corporate agenda building, coalition formation, and decision making on corporate performance.

Using a Behavioral Simulation: An Example

One research project that illustrates a use of simulations to study strategic processes was a study that examined the personality-type preferences of 407 business people and patterns of organizational actions that these individuals recommended (Stumpf & Dunbar, in press). Participants completed the Myers-Briggs type indicator 2 weeks prior to the simulation, and this served as the basis for the personality-type preference measures. Participants' self-reports of organizational actions on a postsimulation questionnaire served as the major dependent variable. The actions taken were categorized a priori

into categories that were reflective of four different cognitive biases (selective perception, positivity, social desirability, and reasoning by analog; Haley & Stumpf, 1989). The results supported the hypothesis that individuals with different personality-type preferences (i.e., sensing-thinking, intuition-thinking, sensing-feeling, and intuition-feeling) are inclined to recommend organizational actions suggestive of different cognitive biases. The value of using a behavior simulation in this research was that a large number of organization actions were possible, but only a small proportion were actually recommended. This design feature permitted different individuals to select both the types of strategic issues and types of organizational action in response to those issues that fit their cognitive style. Since the simulation task encouraged participant interaction, the cognitive preferences exhibited had to persist in spite of the group processes and dynamics that unfolded in the simulation.

Implications for Studies of Strategic Processes

Behavioral simulations overcome many of the challenges confronting researchers who are interested in studying strategic processes. The simulations reviewed here suggest that researchers have several options to choose among in selecting a behavioral simulation, based on a number of research and theoretical criteria.

Innovative research strategies expand the almost limitless possibilities inherent in a simulation for studying strategic processes. For example, in addition to collecting data on strategic processes via questionnaires administered at the end of the simulations, researchers can experimentally manipulate variables of interest and observe their effect on strategic processes or outcomes. Researchers interested in agenda building may wish to manipulate the frequency or format of meetings to observe their effect on information sharing, the identification of new issues, and the speed with which issues are resolved. Alternatively, researchers may embed issues in the simulation that represent important contrasts in theoretically important issue dimensions. For example, research is currently being conducted on how value-laden issues (e.g., issues that evoke strong emotions from simulation participants) are framed and marketed differently than non-value-laden issues. For this research, issues such as "what to do about employees who may have AIDS" or "consideration of mandated drug-testing of employees" are described as issues for particular roles in the simulation. Researchers then track how these issues are raised in interpersonal interactions, what information is used to

document the issue's importance, how the issue is framed (e.g., as a personnel issue or as a moral issue), and finally, how this information and framing relates to the allocation of time and money to the issues (Dutton & Ashford, 1990).

Another possibility would be to use trained observers to record evidence of particular behaviors as an additional avenue for data collection beyond the questionnaires administered at the simulation's end. For example, in a study mentioned earlier on patterns of interest that formed around issues, the researchers had observers record the number and duration of formal and informal meetings in which certain issues were discussed as a supplemental measure of issue-relevant behavior. Again, the possibilities for different modes of data collection are constrained only by a researcher's imagination and available resources.

In the ideal, behavioral simulations could be paired with field studies to provide complementary methodologies for testing propositions about strategic processes. Precedents for this type of method pairing already exist. Nees (1983) studied decision process characteristics in divestment decision making using both method types. Smith, Mitchell, and Summer (1985) demonstrated the complementarities of these two methods for strengthening our understanding of how organizational priorities change over an organization's life cycle. In both studies, the trade-offs implied by McGrath's (1982) discussion of dilemmatics are minimized as a researcher gains precision in measurement and realism in context by using the behavioral simulations, but complements these with results from a field study that stamps generalizability on any findings (Lant, 1989).

While the majority of this article heralded the value of behavioral simulations for studying of strategic processes, students of simulations have made note of some of their limitations, which deserve mention. While the heightened control over the informational environment of simulation participants, the capacity to make close observations of behavior, and the organization-like features of the simulation enhance internal validity of simulation research, the question of external validity and generalizability of results remains. In their review of management games and simulations and their applicability to research, Keys and Wolfe (1990) echoed this concern: "In spite of the realism generated by the games, the risk element of earning or losing real money, long term career effects, and other real life impacts are difficult to simulate" (p. 324). In addition, the learning goals of simulations limit researcher's control over the random assignment of participants to roles because of its possible deleterious effects on what participants take from the simulation. In choosing whether or not to trade generalizability for internal validity, a

researcher must personally wrestle with what trade-offs are necessary, given the stage and goals of the research project. This article has attempted to inform this wrestling process by making more transparent the value of simulations for research questions that focus on the processes underlying strategy formation.

Note

1. We thank an anonymous reviewer for alerting us to this point.

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