Developments in Business Simulation and Experiential Learning, Volume 28, 2001

STRATEGIC SENSEMAKING IN ORGANIZATIONS: MODEL FORMULATION AND OPERATIONALIZATION

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ABSTRACT

This paper is a venture into the area of strategic sensemaking. Sensemaking has become a popular area of investigation for researchers. Sensemaking can be distinguished from a purely cognitive process in that it includes an action component. Interpretation and actions are seen as integral components of sensemaking. Based on the literature, the authors develop a rudimentary model for purposes of categorizing and understanding sensemaking in a computerized simulation. The paper presents the authors model as well as their attempt to operationalize it.

INTRODUCTION

This paper is a foray into the area of strategic *sensemaking*. Most of the research on sensemaking has been confined to practitioner's organizations. This paper attempts to study sensemaking of students as they make decisions in a typical computerized simulation environment. The main purpose of the paper is to establish a framework or grid of categories, which can be used by researchers to examine sensemaking of students. Finally, a sample of the results of the research is compared to simulation performance, as well as to cognitive styles suggested by Breur-Krause, (Breur-Krause, 2000).

One of the most fertile and investigated research areas for ABSEL has been the attempt to isolate and understand those factors that have a statistically significant impact on simulation performance. For example, considerable research has focused on how simulation performance is affected by one or more independent variables, as indicated by the following studies:

- students or instructors, (Platt, 1993)
- leadership style, & cognitive processing style, (Wheatley, et. at., 1991)
- cognitive style & computer anxiety, (Leonard & Leonard, 1994)
- cognitive processing, (Edge, 1981)
- selected cognitive structures and variables, (Wolfe, 1980)
- personality (Gosenpud & Washbush, 1996; Patz, 1990; Anderson & Lawton, 1991)
- team cohesion (Hornaday & Ensley, 2000)
- degree of confidence ((Patz & Milliman, 1992)

The above list is by no means exhaustive. Other venues of research have been the behavior of groups, such as understanding high anxiety groups versus low anxiety groups and their impact on performance (Leonard & Leonard, 1994). Some of the research has looked at the relationship between the independent variable(s) and some measure of performance as affected by moderating or mediating variables. Despite this substantial research, less attention has been directed toward what game players actually think about and what they actually use in making strategically oriented decisions. (viz., *sensemaking*). More precisely, how do decision-makers use or act upon information and knowledge, particularly information, which many believe is important, in making their decisions? Further, what is the relationship between the students' cognition and their actions (as evidenced by decisions made)?

This relationship has received more attention in recent years, as evidenced by the number of studies attempting to understand the concept of sensemaking.

- Do students use the knowledge and information they are given in their coursework to make simulation-related decisions?
- What is relationship between students' cognitive processes and their actions?
- How do students make sense of strategic management models?
- Do different cognitive maps exacerbate this situation?
- What happens in groups?

Presumably, if the relationship between sensemaking and performance is better understood, simulation developers, as well as game administrators can be more effective and more efficient in developing and using computerized simulations.

LITERATURE REVIEW

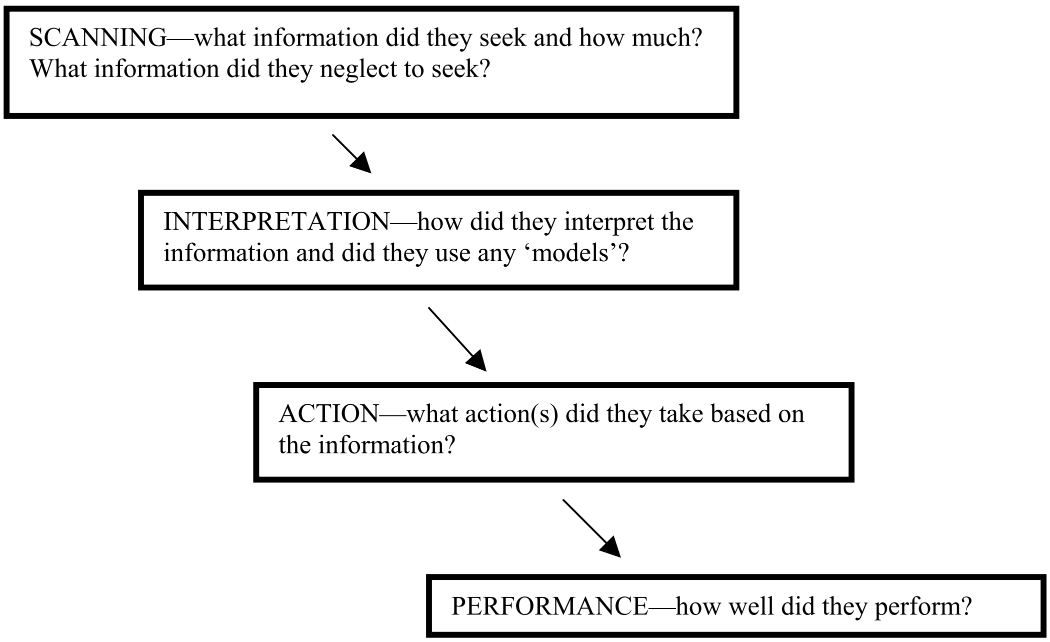
As noted above, contributors to ABSEL, as well as other academic researchers, have focused considerable attention on the relationship between one or several independent variables and simulation performance. A solid body of research has emerged which opens the door for broader and more comprehensive analytical techniques, like *meta analysis*. Less well researched, but of growing interest, is the relationship between performance (whether it be organizational or simulation-based) and *sensemaking*.

Sensemaking is a bi-variate factor, which subsumes or accounts for the *cognition-action* process in decision-making. As Thomas, et al., note, “An important area of concern that has received less empirical attention is the investigation of the relationship among cognition, action and organization performance…There has been a notable lack of empirical work seeking to link ‘sensemaking’…with organizational performance.” (1993, 239-40)

MODEL

The authors employed and modified a model developed by Thomas, Clark and Gioia, (1993), in which to assess or categorize information and actions related to strategic decision-making. The model is shown in Figure 1.

FIGURE 1.



Each of the four areas has a set of questions or measures, which were used to operationalize the area. These can be found in APPENDIX A.

METHODOLOGY

DATA SOURCE. This study used a group of undergraduate students (like much of the ABSEL research). The student sample consisted of a class of typical senior undergraduates taking a capstone course in the area of strategic management. As with many capstone courses, students were required to form teams and play a computerized simulation. The following conditions were laid out for the students:

- Students were allowed to choose their own groups—we believed similar types would cluster together and information might flow more easily with familiarity of members;
- Students were told to keep journals;
- Instructions were given which indicated specific issues to address in the journals;
- Journals would be graded and most of the grade for the simulation component of the course would be based upon the journals instead of their team’s performance in simulation play.

Students were told to focus on the *pricing* decision in writing their journals. The pricing decision was chosen because the price decision for the simulation is subject to more factors, both exogenous and endogenous in a simulated firm, than are the other decision variables. It seemed therefore, that the price variable would be the most fertile for an assessment of student’s sensemaking.

Specifically, students were asked to discuss the following issues in their journals:

- State whether they bought external information and if so, what they did with it;
- State how they thought the price variable related to other variables;
- State whether they had a ‘grand’ strategy and if it changed from period to period;
- State how they used any information from other courses to help determine their pricing decisions.

Students were told to be as explicit as possible, but not to worry about it if they could not explain their decisions in a complete way. There were told that they would not be graded on the *accuracy* of their answers, but on their *thoroughness*. They were asked to use common, ordinary speech in writing their journals and the writer was to try to capture the sentiments of the entire group in writing the journal. It was strongly suggested that the same person from each team write the journal, but there was no practical way to enforce this requirement.

DATA TECHNIQUES & ANALYSIS. The authors reviewed several linguistic-oriented techniques to assist in categorizing and classifying information from the student journals. Repertory grid techniques have been used as a methodology for identifying contents and structures of meaning in a variety of domains (Bannister & Mair, 1968, Dunn, et. al., 1984; Slater 1977; Walton, 1986). The authors reviewed several techniques, including content analysis and lexical analysis, in order to find an appropriate methodology for determining themes and categories for each area (Crouch, A., & Basch, J., 1997). The interpretative approach (Rabinow & Sullivan, 1979) was thought to be most appropriate. The interpretative approach attempts to represent the experience and interpretations of 'subjects' without giving precedence to prior theoretical views that might not be appropriate for their context. In this case, the authors tried to let the journals "speak" without imposing upon them what the authors felt was the meaning. For example, while the authors did use the model described above to guide the research, the authors tried not to impose on the journals an *a priori* meaning or interpretation of what was meant by the words. The authors simply listed words appearing in the journals and then developed word classifications based on the words used.

The analysis entailed classifying and aggregating data from journals in a meaningful way as to derive conclusions about the content of each of the model's three issue dimensions and their frequency of use. For example, issues mentioned first or most—indicate importance—an assumption commonly made in ethnographic studies of meaning (e.g., Spradley, 1979).

DATA RESULTS. The authors had 11 three-person teams playing 6 decision periods (rounds) of the simulation. In other words, the sample size was 33. The authors reviewed the journals after each round making lists of words or phrases used by the teams. The authors then tried to categorize the words or phrases according to whether they seemed to fit in the scanning, interpretation or action frames of the model. FIGURE 2 illustrates some of the words or phrases the authors found in the journals, which can be characterized as scanning activities.

FIGURE 2.

SCANNING WORDS OR PHRASES

- Competitors
- Purchase external information
- Changes in competition
- Changes in the economy
- Changes in the indexes
- Sales growth
- Stockouts
- Excess inventory
- Losses
- Changes in market share

It may come as a surprise to some to note how few journals actually reported what might be construed as scanning activities. Since journals are part of the student team's grade and this topic was covered in class, one would think students would simply report on it in their journals. But as TABLE 1 shows, this was not the case.

TABLE 1. **Number of Times Scanning Was Utilized**

	REPORTING PERIODS						
TEAMS	ONE	TWO	THREE	FOUR	FIVE	SIX	TOTAL
1	1	2	1	1	2	1	8
2	1	3	2	1	0	2	9
3	0	0	1	0	0	0	1
4	3	0	3	0	2	0	8
5	0	0	2	0	1	0	3
6	2	3	3	3	3	3	17
7	1	2	0	1	0	0	4
8	0	0	1	1	0	1	3
9	1	1	0	0	1	0	3
10	0	0	1	2	0	0	3
11	0	0	0	0	1	0	1

Much of the literature on sensemaking is directed toward understanding the relationship between sensemaking (the cognitive-action complex) and organizational performance (Gioia & Chittepeddi 1991; Weick, 1979). While the models, as well as the data are still in a preliminary stage; one cannot help but attempt to draw out the rudiments of what would be a future analysis. For illustrative purposes, the authors selected entries for only the *fourth* journal. This journal was selected as it represents the midpoint of the simulation play. Teams had adequate time in which to understand the game and develop some type of strategy. Further, the authors used—as noted above—*only scanning-related concepts*. These data were compared to performance as measured stock market value and team cognitive style (CIP). In the *DECIDE* (Pray & Strang, 1980) simulation the stock market function is designed so that the stock market value is a summative measure of overall performance. The CIP score was obtained by having each student complete the *Cognitive Profile Inventory* (Breur Krause, 2000). The inventory is based on the work of Carl Jung and is similar to the criteria and methodology of the Myers-Briggs Inventory. These comparison results are shown in TABLE 2.

TABLE 2. Scanning Activity for Period 4, Team Rank Each Period, and CIP of Team Members

TEAMS	Number of Times Scanning Utilized for in Period 4 Journal	Team Rank for Period #1	Team Rank for Period #2	Team Rank for Period #3	Team Rank for Period #4	Team Rank for Period #5	Team Rank for Period #6	CIP*
	1	6	6	7	6	8	7	nt
1	1	6	6	7	6	8	7	nt
	1	6	6	7	6	8	7	nt
	1	11	11	10	8	4	2	nt
2	1	11	11	10	8	4	2	nt
	1	11	11	10	8	4	2	nt
	0	7	4	4	4	2	4	st
3	0	7	4	4	4	2	4	st
	0	7	4	4	4	2	4	st
	0	3	5	3	3	1	1	sf
4	0	3	5	3	3	1	1	nt
	0	3	5	3	3	1	1	st
	0	1	1	1	1	3	5	sf
5	0	1	1	1	1	3	5	nt
	0	1	1	1	1	3	5	nt
	3	2	8	8	11	11	9	sf
6	3	2	8	8	11	11	9	sf
	3	2	8	8	11	11	9	sf
	1	4	3	5	5	10	10	sf
7	1	4	3	5	5	10	10	nt
	1	4	3	5	5	10	10	nt
	1	10	9	11	10	6	3	nt
8	1	10	9	11	10	6	3	nf
	1	10	9	11	10	6	3	nf
	0	5	2	2	2	5	6	nt
9	0	5	2	2	2	5	6	nt
	0	5	2	2	2	5	6	nt
	2	9	7	6	7	9	11	sf
10	2	9	7	6	7	9	11	sf
	2	9	7	6	7	9	11	nt
	0	8	10	9	9	7	8	st
11	0	8	10	9	9	7	8	nt
	0	8	10	9	9	7	8	nf

*CIP stands for Cognitive Inventory Profile. There are 4 major styles and four quadrants are used to represent them: (sensor-thinker, ST; sensor-feeler, SF; intuitive-thinker, NT; and, intuitive-feeler, NF). This is based on the work of Lois Breur Krause (2000).

An obvious difficulty in compiling data for TABLE 2 is what to do with group CIP scores. Can they—should they be an average for the three individuals on each team? Averaging seems particularly inappropriate as individual CIP scores represent a propensity toward one particular style, without capturing the degree of strength toward that style. In other words, being designated with a *ST* (*SensorThinker*) score represents a tendency toward that style. It does not take into account that one may have strong propensities toward one or more other styles.

Nonetheless, the data are interesting. For example, Team 6 had the highest number of scanning activities. They started in 2nd place, yet ended in 9th place. It is interesting that all three members of team 6 were categorized as SF (sensor-feelers). At the other extreme team 3 had the lowest number of scanning activities, but ended in 3rd place and consisted of three members who were categorized as ST (sensor-thinkers).

One might categorize the activity of some teams as the "up periscope-down periscope" phenomenon. Team 4, for example, engaged in high scanning activities for one period and then non-scanning activities for the next consecutive period and so on. It seemed as though team 4 would raise its periscope and take a scan and, spend two game periods utilizing the material it gleaned from the scan. Then the scope would submerge and they did not engage in scanning activities for the next consecutive period. The authors were fascinated that this approach in some small measure lead to team 4's ultimate first place finish in the simulation. Team 4's scanning pattern--although it had an *on again – off again* dimension--could be described as longitudinally uniform. It is interesting that team 4 had members in three of the four CIP categories (i.e., one sensor-feeler, one sensor-thinker, and one intuitive-thinker). Again, the issue of the appropriateness of averaging disparate CIP scores arose and was left unresolved.

Several teams displayed no consistent longitudinal uniformity. It appeared that the incidence of their scanning behavior was almost a random occurrence. The authors did not anticipate this type of behavior. Team 2 displayed this type of behavior. Ultimately they finished second overall in the simulation. The reader is left to wonder if a lack of uniformity might be a very subtle variant of the "up periscope" behavior attributed to team 4.

Team 6 displayed a consistently high level of scanning activity and team 11 displayed low levels of scanning activity throughout. The authors anticipated these polar behaviors. One might attribute consistently low level of scanning to a "Don't rock the boat" or perhaps a "Head in the Sand" strategy. Neither team 6 nor team 11 was particularly successful, in terms their stock market performance, and consequently they finished the simulation with a low ranking.

There is an unavoidable suggestion from these results that a longitudinally consistent pattern of scanning may not be the key to success and perhaps a pattern of intermittent scanning is superior. Perhaps, future researchers will address this issue.

LIMITATIONS. The authors recognize that sensemaking is a relatively new construct and it may be the case that procedures to measure its existence and impact are still evolving. While embryonic research continues in this area, there is not yet even total agreement upon the conceptual definition of sensemaking.

A further limitation is that the authors were not able to fully employ standard ethnographic/interpretive techniques. It is arguable that a more robust research design would have provided for interviews conducted by a third party. Interviews that included more rigorous content and lexical analysis and interviews using repertory grid techniques might have added more validity to the results. On the other hand, one might argue that unobtrusive observation is appropriate and constructive in conducting studies of human behavior and minimized potential biases that may result from more intervention by the researchers. Finally, as Table 2 illustrates, data analysis is particularly nettlesome, especially with respect to the significance of the team member's CIP scores, which means more definite pronouncements cannot be made at this time. Thus, the model, as well as the measures, remain a work in progress.

CONCLUSIONS

The purpose of this paper was to develop and operationalize a framework to study sensemaking among student decision-makers. The model developed by Thomas, et al. (1993) was modified for that purpose (Figure 1), and the authors made an attempt to demonstrate the potential benefits of the model in a different setting, part of which is reported in this paper (i.e., scanning). The reader is reminded that the model is a guide and not a hypothesis. The point of the research is not to prove or disprove the model, but to investigate sensemaking.

The authors employed various ethnographic/interpretive approaches in examining the ways in which language was used to convey sensemaking in the undergraduates as they made strategic decisions on a typical computerized simulation. This is because sensemaking cannot be divined from instructor-induced models or requirements

As noted above, sensemaking has emerged in its own right as a unitary and distinctive construct. However, most research on sensemaking has been conducted in the area of practitioner organizations. The authors believe that the concept can be applied profitably to investigate decision making in undergraduates. Simulation instructors, for example, might be interested to know if and what knowledge and information students actually use in making their decisions. Such knowledge can not only help in constructing simulations, but also in devising ways in which to enhance classroom instruction.

While a computerized simulation is an appropriate means to ascertain and evaluate strategic decision making, it does not provide one with a complete picture.

FUTURE DIRECTIONS. Several research venues await the interested investigator. The model needs to be evaluated, tested and perhaps refined and more thorough data techniques need to be employed. Further, while a computerized simulation is an appropriate means to ascertain and evaluate strategic decision making, it does not provide one with a complete picture. Experiential exercises need to be used (and developed if necessary) complementing computerized simulations. Finally, researchers, as well as classroom instructors may well be interested in the following questions:

- Did students with similar cognitive profiles perform similarity in sensemaking to those with mixed styles?
- Do students with similar styles perform better than those with mixed styles?
- Do students tend to choose teammates with similar cognitive styles?
- Can sensemaking be manipulated or enhanced by instruction or other means?

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APPENDIX A

SCANNING

- number of times competitors were mentioned
- number of external reports purchased

INTERPRETATION

- number of options listed
- mention of marketing concepts
- mention of financial concepts
- mention of production concepts
- ambiguity

ACTION

- feeling of control
- listed possible actions

PERFORMANCE

- sales
- profits
- stock market value
- team ranking