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A STRUCTURED FRAMEWORK FOR APPLYING CONCEPTUAL MODELS TO PROBLEM ANALYSES: HARDENING UP

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ABSTRACT

This paper extends a well known approach to analyzing interpersonal problems. It outlines a rigorous, systematic, "hard" framework for solving such problems. The framework emphasizes the usefulness of the conceptual model. The objectives are to improve the quality and consistency of managers' decisions and to facilitate the process of grading students' case and exercise analyses. The framework might be useful to those who are concerned that behavioral science is too "soft" for explaining, prescribing, and predicting management activities.

A PROBLEM

There is a pervasive problem facing those of us who would attempt to teach the theories and applications of behavioral science. We hear about it at conferences and on comprehensive exam committees. We read about it in the teaching journals. This problem concerns the "softness" of behavioral science and the consequent difficulty of evaluating students' solutions (or any solutions) to interpersonal situations. The problem exists partly because there are often many good solutions to interpersonal situations, partly because we sometimes lack clarity in our own thinking about such situations, and partly because students do not structure the logic of their solutions clearly enough for us to follow them.

One resolution to the problem is to adopt the following assumptions.
1. Students begin a course already knowing a lot about solving interpersonal problems.
2. Students can benefit from each other through a synergistic learning process.
3. A teacher's supportive behavior in class will be emulated by students when they become managers.
4. Supportive behavior by managers is always good for organizations in terms of producing valued outcomes.

Acceptance of these assumptions leads to the following conclusions: A teacher, particularly an OB teacher, should be a model of supportiveness. A teacher is most effective in the role of facilitator. A teacher should refrain from directing and correcting in favor of supporting students' thoughts and feelings. Therefore, there are no wrong solutions to interpersonal problems. If there are no wrong solutions, then evaluation is moot; except that there might be some solutions that are more right than others.

Several years ago, I adopted the philosophy and role of facilitator for three sections of a graduate OB course over a period of two years. I found that the students did not feel supported. They expressed doubt that there was any content at all in our discipline and charged that whatever content we had was, "only common sense." Maybe I was doing it wrong. Maybe the students were not ready. Maybe the quantitatively- oriented curriculum produced a climate that inhibited the facilitative approach. However, my general perception was that the students felt frustrated by being allowed to flounder with only their previous knowledge and group norms to guide them. The anarchy led to anomie, and then to apathy. Informal exit interviews with graduates of both PhD and masters programs have indicated that the whole "soft" area of management is considered to be something of a joke.

This criticism is not unique to my institution. At every professional meeting I have attended, sooner or later the conversation has turned to softness. I was originally sensitized to this issue at a meeting where colleagues from other institutions were discussing the softness criticisms of our discipline.

In evaluating the appropriateness of softness, we need to question the four assumptions stated above. I believe now that assumption 1 was false and number 2 was questionable for my students. They did not begin the course knowing much about solving interpersonal problems and their group processes were not particularly synergistic. (Most of them were majoring in mathematics or quantitative methods. It seemed ironic to me that students majoring in those particular disciplines were criticizing OB for being "only common sense." I failed to provide structure and to teach content, and they needed those dimensions -- especially in an introductory course.) Assumption 3 has considerable research support, although it seems somewhat presumptuous to expect that our students will attempt to emulate our classroom behavior. However, assumption 3 is moot if assumption 4 if false; and it is. If we believe the contingency leadership theories of our own discipline, we have to conclude that supportive (consideration, relationships-oriented) behavior is good only sometimes.

A SOLUTION

This paper suggests a structured approach to incorporating the content (theories) of our discipline into rigorous analyses of interpersonal problems. The short- run intent is to improve students' understanding of OB theories and their applications, and thereby to improve students' case and exercise analyses. Secondarily, the structure makes their analyses much easier to grade. The long-run goal is to give students a rigorous, systematic, structured, disciplined, "hard" approach to solving interpersonal problems that they can use to improve the quality and consistency of their decisions when they become managers.

I require case and exercise analyses to be written in outline form for two reasons. First, the outline form reduces the likelihood that students will omit important elements of an analysis. Secondly, the outline greatly facilitates the grading process. In order to ensure (almost) those two benefits, I spend seven 50- minute class periods presenting the framework and using it to analyze a practice case. The third and fourth weeks of my OB course become a mini-course in case and exercise analysis.

The following outline has evolved over several years and seems to have stabilized somewhat. Sections I, II, and III of the outline come from Homans' work on social systems [2;3J as modified by Cohen, Fink, Gadon, and Willits [1] in their Basic Social System Conceptual Scheme. Cohen, et al. [1, p. 67-79] thoroughly describe these sections and I will just outline them, but not discuss them, here. The percentages at the left

show the weights I use for grading each of the sec- t ions.

Outline Framework

20% 1. Background factors (conditions preceding an interpersonal relationship).
   A. Personal system (set of values, needs, abilities, etc.).
   B. External status (social position outside the group).
   C. Organizational culture (socially transmitted beliefs, behavior patterns, and climate).
   D. Technology and layout (required skills, physical arrangement of people and things).
   E. Reward system (set of interrelated Outcomes intended to motivate).

10% II. Required system (outcomes required or expected by the formal organization).
   A. Activities (behavioral acts that are supposed to be done).
   B. Interactions (intended transfer of communications or things).
   C. Attitudes (intended satisfaction or dissatisfaction).

20% III. Emergent system (events that actually occur in the informal organization -- symptoms of possible problems).
   A. Activities (behaviors that actually occur).
   B. Interactions (communications and transfers that actually occur).
   C. Consequences (problems in terms of:)
      1. Productivity
      2. Satisfaction (This replaces "Attitudes" in the emergent system, as described by Cohen, et al.)
      3. Learning/development

40% IV. Conceptual models (theories of OB).
   A. First model
      1. Description of model (What are the independent, dependent, mediating, and moderating variables and their interrelationships?)
      2. Explanation of emergent system (Why did the emergent system occur as it did? How did the background factors and required system produce the emergent system?)
      3. Recommended solutions (How should the independent or moderating variables in the model be changed to produce the desired changes in the mediating and dependent variables?)
      4. Predictions (what will result if the recommended solutions are implemented?)
   B. Second model

10% V. Plan of action (Who will do what? With what resources? When? For how much?)
   A. Activity-based program and schedule
   B. Activity-based budget

The rest of this paper discusses sections IV and V of the outline (primarily section IV) in an attempt to extend the Basic Social System Conceptual Scheme [1] of sections I, II, and III.

Conceptual Models

The purpose of section IV is to elicit a rigorous explanation and solution of the problem(s) that were defined in the consequences of the emergent system (section III, C). The explanation and solution must be guided by one or more conceptual models.

Before describing section IV to students, I discuss models in general. I give them Kerlinger's [4] definition of a "theory", calling it "model". Here, I emphasize that models give structure to problems by specifying relationships among variables in order to explain why the problems exist, to suggest solutions, and to predict possible consequences of those solutions. I discuss causal relationships and give brief examples of dependent and independent variables, such as in expectancy theory:
[Motivation = $\sum$ (Valence x Instrumentality x Expectancy)],
and in equity theory: [Satisfaction = f(Outcomes/In- puts)].

For the first of many times in the course, I point out how models can be useful to managers. They can help managers make sense out of a chaotic world by giving structure to their thinking. Models can suggest courses of action for managers. Primarily, models can improve the quality and especially the consistency of a manager's decisions, and thereby improve the manager's track record, and thereby lead to better jobs, more responsibility, more money, and .... I suspect that only the most gullible and docile students believe all of this the first time I tell them. Nevertheless, most of them get much of it into their notes and start thinking about it. The promise of relevance seems to be a magnet that holds their attention while I talk about how to choose the right model to solve the problem.

Students often find it difficult to choose the "appropriate" models for making decisions. They feel unfamiliar with applying models; and, therefore, they feel anxious. I remind them that the skill is not new to them. Ever since junior high school, they have been applying models to physics, geometry, and statistics problems. Familiar examples, to convince them of this point, include the "formulas" for time-speed-distance problems [d = st], the area of a circle [$A = \pi r^2$], and the arithmetic mean [$\bar{X} = \sum Xi/n$].

Clearly, the primary criterion for choosing a model to explain a situation and solve a problem is relevance. The variables in the model must be the same as those in the problem defined in the consequences of the emergent system (section III, C). It is nonsensical to apply the equation for the area of a circle to the time- speed-distance problem. It is equally nonsensical to try to fit a theory of group dynamics to a situation that was defined in the emergent system as a problem of low productivity of a single individual. None of the group dynamics variables are relevant to the problem. Yet, students often try this in their early attempts.

The number of attempts to apply models in a seemingly random manner is appalling. I have found, from discussing this with students, that much of the reason for the inconsistency is that case teams have delegated tasks by section of the outline, forgetting to coordinate efforts among the members to ensure consistency. Since the internal consistency of an analysis is a primary criterion for grading, students quickly learn the value of intragroup coordination. Specifically, all the sections of an analysis must be mutually consistent. The conceptual models have to show how the background factors and required system caused the emer-

gent system and what can be done about the undesirable aspects, if any, of the emergent system. Thus, group members learn to work interdependently.

Plan of Action

An additional consistency check comes with section V, the plan of action. Section V shows how to implement the recommendations of the conceptual models in section IV, A, 3; B, *3;* etc. Therefore, those recommendations, and only they, must be included in the plan of action. The plan of action comprises an activity- based program and schedule and an activity-based budget. The program must list the specific activities that were implied by the recommendations of the conceptual models, and must specify the resources needed to accomplish these activities. The schedule must be expressed on a Gantt chart that shows when the activities will be done. The budget must list all the activities in the program and on the Gantt chart, and cost them out by multiplying the quantity of each resource (usually man-hours) by its cost per unit. For example:

(2 managers)(30 hours)($20/mgr. hr.) $1200.00

(15 workers)(100 hours)($9/skr. hr.) = 13500.00

$14700.00

I require neither extensive budgets nor documented figures. I assure students that it can be very time consuming and expensive to collect complete, accurate information for the budget. Instead, I emphasize the process of building programs, schedules, and budgets rather than accuracy and completeness. I am usually satisfied if students program, schedule, and budget for four or five activities, even though a complete plan might call for hundreds of activities. Budgets vary drastically from one group's analysis to another' s.

A Sample Application of a Conceptual Model

After discussing the use of models and developing a plan of action, I spend five class periods on a sample case analysis. For example, the emergent system in the Slade Company case [1, p. 716-7261 concerns an extremely cohesive group whose members restrict productivity by embracing a norm that violates company rules. They are highly satisfied, they refrain from challenging the group's norms, and they share information freely within the group; but they tend to reject information coming from outside the group.

The cohesiveness model [1, p. 87-96] is very appropriate for explaining the emergent system in the Slade Company. Section IV, A, 1 of the outline calls for a description of the model. The following brief description of the cohesiveness model would be appropriate for this section.

There are nine independent variables that cause cohesiveness (frequent required interactions, common attitudes and values, a common enemy, etc.). If these conditions exist at high levels, the result is cohesiveness, which is a mediating variable because it is caused by the nine independent variables yet it influences productivity, satisfaction, and learning. Cohesiveness causes high productivity if the group's norms support productivity goals; low productivity [f the norms resist those goals. Cohesiveness always leads to high satisfaction. Cohesiveness enhances learning to the extent that group members support norms that allow members to (a) confront one anothers' weaknesses or (b) to accept information from external sources. Thus, the model contains three moderating variables: (a) the extent to which the group supports productivity moderates the cohesiveness-productivity relationship, (b) the extent to which the group allows intermember confrontation moderates the cohesiveness-learning relationship, as does (c) the extent to which the group accepts outside information.

Section IV, A, 2 calls for an explanation of the emergent system. The following explanation would fit there.

The nine independent variables all have high values in the background factors and required system of the Slade Co. group. Therefore, cohesiveness is high for that group. The group norms resist productivity during weekdays but they support it on weekends. Therefore, the cohesiveness leads to low productivity during the week but high productivity on weekends. Also, no group member confronts the group with the impropriety of the "punch-out system", whereby group members take turns punching everyone else out on the time clock at 5 p.m., long after everyone else has split for the day. The high cohesiveness, interacting with the lack of inter-member confrontation and with the lack of acceptance of outside information, leads to groupthink, which allows the group to justify the illegal practice.

The recommendations (section IV, A, 3), must be guided by the relationships among the variables of the model. A desired change in the dependent variables must be produced by a management-induced change in one or more of the independent or moderating variables.

In the Slade Co. case, desires to ensure reasonable pay, security, and autonomy were the causes of the norm to restrict productivity. Therefore, it is reasonable to assume that the norm would change to support productivity if the group members were to participate in the solution, and if they were reasonably certain that their needs and values would continue to be fulfilled. These needs and values would have been listed earlier in the analysis under "Personal System" (section 1, A of the outline). They include security, affiliation, achievement, autonomy, altruism, and creativity. The model suggests taking advantage of the already-high cohesiveness while attempting to change the moderating variables, such as the norm of slowing down during the week. If this approach fails, then the manager might attempt to lower the cohesiveness by lowering the levels of one or more of the independent variables (for example, changing the shop floor layout so that group members find it more difficult to interact with each other, or requiring additional external interactions).

Section IV, A, 4 of the outline calls for prediction of the new emergent system, which will result if the recommended solutions are implemented. This new emergent system can be predicted in terms of three conditions.

1. If the plant manager were to "blow the lid off" as he has suggested, the group would have another common enemy, the manager. Therefore, cohesiveness would increase, the moderating group norm of resisting productivity would become even stronger, and productivity would decrease even further.

2. If group norms can be altered so that they support productivity during the week, as well as on the weekends, the high cohesiveness would lead to high productivity rather than low productivity, and satisfaction would remain high. (Other models specify relationships between dissatisfaction and several dysfunctional outcomes such as unionism, grievances, and many forms of work avoidance. However, the cohesiveness model does not specify these relationships.)

3. If group members can be convinced that their behavior is reducing company profits, possibly reducing their own wages, and causing anxiety for the plant man-

ager, then someone in the group is likely to confront the offending norm. If so, the groupthink might cease and members would no longer feel that their "punch-out system" is justified.

It is likely that the latter two conditions would follow if the manager shared the problem and his anxieties with all group members, through the informal group leader, and involved them in the solution.

A Short Outline for Exercise Analyses

I require the foregoing framework for analyzing cases. However, recommendations, predictions, and plans of action are not usually relevant for exercise analyses. Therefore, for exercise analyses, I require only a brief description of the emergent system, and descriptions of models and explanations of the emergent system (section III and sections IV, A, 1 & 2; B, 1 & 2; etc.). An exercise analysis needs to describe, briefly, the emergent system and to explain why the activities and interactions of the emergent system occurred as they did in a given exercise. As in case analyses, students must use conceptual models to show why the background factors and the required system led to the emergent system. However, for exercise analyses, they need neither to list background factors, nor to describe the required system, nor to develop a plan of action. The task is to use conceptual models to explain why the emergent system occurred the way it did.

Grading

Grading is quite straightforward and easy to justify to students (I think). The major grading criteria focus on the quality of analysis.
1. Are the elements of the analysis accurately classified into their correct categories?
2. Are the conceptual models appropriate for explaining the emergent system. In case analyses, are the conceptual models appropriate for recommending solutions and for predicting consequences of these solutions.

3. How internally consistent is the entire analysis, both within and among sections. Are the specified background factors and required system incorporated in the conceptual models when the models are used to explain the emergent system? Does the plan of action specify an activity-based program, schedule, and budget for all the solutions recommended by the conceptual models?

CONCLUSIONS

Limitations of Models

Models do not help us to diagnose problems nor do they give us specific courses of action. In fact, it is possible that models can interfere with diagnoses. If we become dogmatically attached to a limited number of models, we might easily fall victim to the hammer-and- nail disease, "If the only tool I have is a hammer, then I see every problem as a nail." Models can be useful tools, but we need a broad selection of them to fit the broad selection of problems. Given a diagnosis, a model can structure our thinking by systematically specifying relationships among independent and dependent variables (causes and consequences). Knowledge of these relationships enables us to explain why an emergent system has occurred the way it has, to recommend ways to change the emergent system as desired, and to predict the new emergent system that will result if those recommendations are implemented.

The specific solution of the Slade Co. manager's problem depends on the outcome of his talk with the group. Feasible solutions would include (a) formalizing the flextime that the group has implemented informally through its "punch-out system", (b) MBO, or (c) incentive pay.

It is clear that the cohesiveness model is not sufficient to provide a full explanation of the emergent system, nor does it suggest the complete design of a solution to the problem (any more than Bernoulli's theorem is sufficient for the complete design of an airplane). Equity theory would be very useful for explaining the slowdowns during weekdays, when pay is low, and the speedups on the weekends, when pay is relatively high. It also predicts higher productivity and satisfaction if pay is increased. Expectancy theory would be useful for contrasting the manager's motivation for "blowing the lid off" vs. taking a more participative approach. To calculate the manager's motivation to follow each of the courses of action, we need to determine: (a) the valences of all possible outcomes, (b) the instrumentalities of eliminating the "punch-out system" for each of these outcomes, and (c) the manager's expectancy that each course of action will lead to eliminating the "punch-out system." Contrasting the two levels of motivation for the two courses of action enables us to predict which course the manager will take.

The process of analyzing a problem by breaking it down into its components can clarify managers' thinking about why they should choose a particular action. The variables of a conceptual model are these components. Knowledge of models can improve managers' decisions. If we teach the models but not how to apply them, then we are wasting students' time. If we do not teach the models, then we are wasting a vast amount of research. In either case, we deserve to be called "soft".

REFERENCES

[1] Cohen, A. R., Fink, S. L., Gadon, H., and Willits, R. D., Effective Behavior in Organizations (Home- wood, IL: Irwin, 1984).

[2] Homans, G. C., The Human Group (New York: Harcourt, Brace & World, 1950).

[3] Homans, G. C., Social Behavior: Its Elementary Forms (New York: Harcourt, Brace & World, 1961).

[4] Kerlinger, F. N., Foundations of Behavioral Research (New York: Holt, Rinehart and Winston, 1973).