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A Technique for Predicting Intraorganizational Action

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ABSTRACT

This paper is addressed to the problem of forging a closer link between theoretical and empirical analysis of a given organization. An analytic research method and instrument capable of systematically transforming certain theoretical organizational concepts into operational form is presented. The technique and its instrumentation were designed to, when fitted with appropriate theoretical substantive variables, efficiently yet accurately describe, explain, and predict the consequences of changing specified organizational variables within an organization.

To predict the results of organizational action requires analytic techniques that, when fitted to appropriate theory, can quickly and efficiently seek out and measure crucial variables that offer understandable and reliable explanations of intraorganizational action. Many theorists have proposed models to explain intraorganizational action, most of which do provide guidelines for predicting the consequences of such action. Prediction, however, requires empirical data and tools, which we generally do not have. There is the need to forge a closer link between the theoretical and empirical analysis of organizations.

In this paper, I have attempted to describe an analytical technique that can, for a given organization, quickly, accurately, and efficiently transform abstract theoretical propositions into concrete empirical indices. The problem as stated calls for the development of an analytical technique and instrument that will systematically put basic theoretical concepts into an operational form.

In order to do this, it was first necessary to determine what important or limiting factors are related to intraorganizational analysis. A search of the literature

reveals some common threads that are generally recognized by all organizational theorists.

First, it was quite clear that perceptions of an organization itself vary. Not only do views of an organization change with time, but the characteristic properties included in the many perceptions held about an organization tend to vary with the position from which the view was taken. Was the organization perceived from the public view? From the internal organizational view? From the view of an impartial analyst? Or from the view of a person occupying a position within that organization?

The analyst of an organization is thus presented with the dilemma of determining whose view, or what view, accurately depicts the crucial aspects of the organization's operation. Regardless of the accuracy or validity of the various views or images held concerning the organization, however, these views do affect the operation of the organization.

This leads us directly to the second dilemma. By what criteria can the many views be measured and weighed? How do we determine the relative importance of these many views for any given organization?

Some theorists maintain that answers to these questions can be obtained by using rational techniques. They argue that, because an organization is a rationally conceived creation of humans, it can be analyzed on the basis of measurements taken from its formal patterns of operation. Other theorists argue that it is not enough just to measure or manipulate the formally described elements of an organization. They contend that an organization also must deal with its external environment, which is not always rational in design. For them, measures that tend to emphasize the organization's equilibrium and how this equilibrium is maintained become an appropriate analytic form.

Yet another concern of theorists is the level at which these measurements should be taken. Should they be taken at the survival or sheer maintenance level of organizational operation, at the point of most effective operation, or at the point of efficient resource maximization?

All theorists ultimately face the question of measuring, or at least dealing with, specific organization of goals and subgoals. The problem again becomes one of choice—whose goals, or what goals, are to be dealt with, and at what level of achievement are they to be measured or evaluated?

These are but a few of the problems, admittedly oversimplified, that have been faced and must continue to be faced by those who would theorize about, or analyze, organizations. The solutions to these many problems must finally be measured against the value system selected as a standard in the analysis. Will it be (1) the value system of the organization's members, (2) the value system of the organization's resource input system, (3) the value system of its product

user system, (4) the value system of total society, or (5) perhaps all of these and more?

It is sufficient to say that overwhelming difficulties beset any organization analyst from the start. For even if a satisfactory method were available for dealing with these problems, no doubt the simple things such as the availability of a researcher's time and the physical resources available to an analyst are important limitations that would soon become the major limiting factors to a meaningful detailed analysis of any specific organization.

The technique presented here represents a synthesis of features from three organizational models—the rational, natural system, and effectiveness models—with certain concepts taken from a fourth, the perceptual model (Howard, 1958:1–46; March & Simon, 1959:9–11, 50–65, 121–29; Snygg & Combs, 1949:13–21). This technique attempts to satisfy Gouldner's (1959:426) plea for a resynthesis of the rational and natural system models. It is also compatible with Etzioni's (1960:278) suggestion that the "system model," with its view of the social unit as a process and its insistence on examination of the external and internal conditions that enable it to function, is the most appropriate means of studying organization. This technique attempts to fulfill the scientific purposes of description, explanation, and prediction (Hempel & Oppenheim, 1953) of an organization's efficiency in achieving its goals.

Characteristics of Organizational Systems (Andrew, 1961:20–23)

An *organization* is an artifact. It is a social group; but unlike a natural society, it has been assembled to serve a purpose. It is a bureaucratically arranged social group with at least one specifiable goal (Simon, 1964:1–22). That is, its members have differentiated functions that relate to a goal of the organization (an organizational goal is a state of affairs for which the organization exists to bring into being, an image of a future state which may or may not be brought about). Once a goal is achieved, it becomes a part of the organization or of its environment and is thus no longer an image guiding organizational activities, and no longer a goal (Etzioni, 1961:71–72).

A *system* is considered to be a conventionally selected set of variables that interact. These variables are defined in such a way that, given the state of the system at specified time intervals, its state at any other given time can be predicted. This set of interacting variables may be (and doubtless will be) a subset of a larger set of variables. In other words, the system to be studied may be a part of a larger system.

The *elements of a system* are the entities of the system that reflect its substantive content. They are the descriptive terms of the system. *Variables of a*

system are the conditions of these elements within an organization at given times. The values of the variables at any given time define the state of the system at that time. They carry the implications of change or variation regardless of the precision with which this change can be measured.

Parameters of the system are the condition of elements outside the organization that act and interact upon it as environmental variables. Both the internal organizational *variables* and the *parameters*, or external organizational variables, have a wide range of effects on an organization. To induce change, one must determine those variables that are significant to the functioning of the organized system, for change in an organization occurs through change in either or both the *variables* or the *parameters* of a system.

In selecting the elements to include in an analysis of an organizational system, the theorist (Andrew, 1961:20–23.) ultimately asks this basic question: Should the element or variables to be used in analyzing a system be selected by *a priori* logic or through successive empirical testing methods? Parsons (1956:63–85), for example, attempts to identify the constituent elements and their relationships in a total social systems model. For Parsons, organizations are total social systems with primary orientations toward the attainment of specific goals. With this concept, Parsons assumes that the parts are interdependent. Merton (1957:25, et seq.), in his concern for the degree of interdependency of organizational parts, attempts to select elements of a system on the basis of empirical determination. Gouldner (1957:400–28) sees the selection of elements as a cumulative process through which a battery of explanatory variables will be sifted out by empirical observation. He states unequivocally that the inclusion or exclusion of elements in the social system is not susceptible to “purely theoretical resolution.” He points out that “problematic patterns” can only be partially explained on an empirical basis because only a partial knowledge of the constituent element of a social system can be obtained with empirical accumulation techniques. It would not be possible, therefore, to relate those patterns to the system as a whole.

It is clear that when the selection of elements is made, some important element or variable may be left out because the process of selection is an arbitrary one. Consequently, the methods of both *a priori* and empirically tested selection are necessary. The determination of what elements to include falls into the context of discovery, while empirical testing for accuracy of the selection falls into the context of validation.

No satisfactory means has yet been developed to systematically take into account the significance of variation in the degree of interdependence of selected elements, because they are parts of an “open system.” Therefore, the patterns of behavior can be only partially explained for a given period of time, for all systems have an infinite set of properties. In the methodology developed for

this paper, it is suggested that *variables* will account for the relationships of the internal system elements selected, and the *parameters* may account for environmental change. The external factors, *parameters* or environmental, should be reflected, at least in part, by the perception of position incumbents of the system under analysis.

This methodology suggests an approach that attempts to resolve both the question of element selection and the question of degree of variation, or interrelatedness, of these elements. Note that the schema outlined calls for identification and selection of the *elements* of the organization to be analyzed by the members of that organization. This is accomplished by use of the "Open-Ended Question" (OEQ) device. *Variation* in the interrelatedness of these elements is also measured by the organization's members, by their scalings on an instrument called the "Rating Scale" (RS) device.

The Theory to Be Used

Within this framework, it is now possible to fit a theory to the analytic technique. The theoretical organization concepts developed by Sower (Sower, et al., 1962:87-151; Sower, 1962) are used as the substantive theory fitted to the analytical methods and tools described in this paper. It should be clear from the outset that the technique described can be fitted with a wide range of theoretical substantive variables. The technique and instruments described provide the means for transcribing these theoretical variables into concrete empirical, analytical forms.

The major assumptions of Sower's theory are:

1. The key to understanding and explaining the operations of an organization and their consequences is the organizational link between its subgroups.
2. The extent to which an organization achieves its goals is a consequence of certain internal variables. These variables are subject to change upon decisions of persons who occupy specific positions in the organization.

A corollary of this assumption is that these variables, when identified, are capable of being described and explained and the relationships between them predicted.

3. The actions of the incumbent of a position within an organization will agree with his/her own expectations of behavior proper to that position and what he/she perceive the expectations of relevant others to be, whether they are shared by a majority or not, and whether or not his/her perceptions are accurate.

The relationships between the organizational variables are explained by Sower's *Model for Explaining and Predicting the Relationships between Inter-*

nal Organizational Variables and the Extent of Goal Achievement for a Development Organization. Briefly, this model accounts for the following internal relationships:

1. The extent to which the organization's members have a clearly defined conception of its purpose or goal.
2. The extent to which the organization imposes upon its members patterns of expected behavior that are congruent with their own behavior expectations.
3. The extent to which the organization's members are interested in achieving its goals.

These relationships are the intervening variables of the model; consensus among members of the organization on each variable selected directly determines the extent to which the organization is likely to achieve its goal. Postulates constructed from these three intervening variables may be expressed as follows:

Postulate I:

The degree to which an organization will achieve its goal is directly related to the extent to which its members have a clear conception of the organization's purpose or goal.

The general predictive formula expressing this relationship is: ${}^{\circ}\text{OGA} \int {}^{\circ}\text{COG}_m$ when ${}^{\circ}\text{OGA}$ = the degree of organization's goal achievement and ${}^{\circ}\text{COG}_m$ = the degree of clarity of members' conception of organization's purpose or goal.¹

Postulate II:

The degree to which an organization will achieve its goal is directly related to the extent to which the organization imposes on its members patterns of expected behavior that are congruent with their own behavioral expectations.

1. The symbol \int represents the phrase, "...is directly related to..." and will be used in this sense throughout this paper. Note that Sowers' constructs call only for the perceptions of organization members. These are called *variables of the system*. The subscript "m" in the formula expresses this limitation. If the theory used called for perception of external "relevant others" who are not formal members of the organization *parameter of the system* as well as member perceptions, the technique will accommodate such a formulation. This would be expressed in Postulate I by use of the subscript "o," in the following manner ${}^{\circ}\text{OGA} \int {}^{\circ}\text{COG}_m \int {}^{\circ}\text{COG}_o$.

The general predictive formula expressing this relationship is: ${}^{\circ}\text{OGA} \int {}^{\circ}\text{CBE}_m$ when ${}^{\circ}\text{OGA}$ = the degree of organization's goal achievement and ${}^{\circ}\text{CBE}_m$ = the degree to which members have behavioral expectations congruent with that of the organization.

Postulate III:

The degree to which an organization will achieve its goal is directly related to the extent to which its members are interested in achieving the goal.

The formula expressing this relationship is: ${}^{\circ}\text{OGA} \int {}^{\circ}\text{IOG}_m$ when ${}^{\circ}\text{OGA}$ = the degree of organization's goal achievement and ${}^{\circ}\text{IOG}_m$ = the extent to which position incumbents, or organizations' members, are interested in achieving the goals of that organization.

Population and Sampling Procedures

The population is defined as all the members of the specific organization to be studied. In studies of organizations with relatively few members (100 or less), the total population may be included in the sample. In studies of large organizations (over 100 members), a stratified random sample of respondents of an appropriate but manageable size should be drawn as outlined by Kish (1953:175-239). The stratification criteria may be the hierarchical division already existing in the organization. Other criteria also may be specified. Random samples of respondents should be drawn from each stratum.

Element Identification and Measurement

The identification and measurement of the elements called for in the Sower model are made as follows:

The subcategories (or elements) that make up the independent variables are determined by a questionnaire constructed along the lines of the *Twenty-Statement Problem*. I call this an Open-Ended Question Device (OEQ device) (Kuhn & MacPortland, 1954:68-78).

This device is administered to respondents at all levels of the organizational hierarchy. The OEQ device asks respondents to express their personal notions about each of the three independent variables derived from the three postulates listed above.

Responses to the OEQ device are then categorized and reworded to form a Rating Scale device, which is then administered to respondents for scaling. Data derived from the Rating Scale device form the basic interval scale data used in statistical manipulations to determine the degree of consensus and rank-ordered differences in the perceived expectations of the different respondents toward the three major intervening consensus factors selected for analysis.

The Open-Ended Question (OEQ) Device

The Open-Ended Question device is a relatively unstructured instrument that attempts to determine the concept of the purpose or goal of an organization as seen by its members. The OEQ device consists of one question per single page, followed by blank spaces in which respondents are asked to answer the question.

The questions are derived from the theoretical postulates used in the analysis. For example, questions derived from Postulate I as used in a research setting read as follows (Anderson, 1963):

The Michigan Livestock Health Council is now one and one-half years old.

A. What do you believe to be the purpose of the Michigan Livestock Health Council?

- 1.
- 2.
- .
- .
- .

B. In your opinion, what do others who are interested in livestock and livestock products now think the purpose of the Michigan Livestock Health Council to be?

- 1.
- 2.
- .
- .
- .

C. In your opinion, what are the most important specific projects that the Michigan Livestock Health Council has engaged in?

- 1.
- 2.
- .
- .
- .

D. In your opinion what specific projects should be acted upon by the Michigan Livestock Health Council?

- 1.
- 2.
- .
- .
- .

Since the OEQ device is a self-administering paper-and-pencil test, it can be administered directly to respondents on an individual or a group basis, or indirectly by mail. The following assumptions underlie use of the Open-Ended Question device:

1. The internal conception of an organization is related to the way members of the organization act and how they identify themselves in relationship to the actions and identities attributed to them by others who hold authoritative positions and who ascribe roles. The self-conception of an organization is formed from the experience of its members. This self-concept and self-expectation of members lead to an organizational self-concept and self-expectation that guides the organization's ongoing social behavior. Consequently, these self-expectations of the organization have predictive utility.
2. The important elements of an organization's self-conception are accessible and indexable at the awareness level through statements of members. The solicitation statements about an organization from its members provide a direct approach to the organization's self-conception. When members are confronted with the problem of identifying the organization of which they are a part, they must decide for themselves how this identification will be made. They do so as socialized members of the organization and therefore tend to reflect the normative expectation and behavior patterns that specifically characterize that organization.

Obviously, an infinite number of descriptive statements could be made by members about the organization of which they are a part. Consequently, the OEQ device accounts for a very small fraction of all possible elements of descriptive statements that respondents might make.

Research utilizing the similar Twenty-Statement Problem (Kuhn & Mac-Portland, 1954:68-78) indicates that even a small sample of statements about the self is useful, since it permits stable differentiation among persons and reliable predictions about their behavior. It is held, then, that an analytic transfer of self-concept from an individual to an organization can be made without a significant loss in the reliability or predictive usefulness of the Twenty-Statement Problem methodology, or in this case, the equivalent OEQ device.

Administration of the OEQ Device

As mentioned, respondents to the OEQ device may be gathered in groups (conference setting) or dealt with individually, either directly or by mail. In any setting, the respondents must be given an acceptable reason for responding. Reasons given will vary with circumstances, but respondents must be assured that (1) they are free to express their deep-felt concerns about the organization, (2) these concerns will be consciously considered in future decision-making actions of the organization, and (3) no personal punishment or reward will be forthcoming as a result of wholehearted participation in the analysis.

In order to preserve the unstructured nature of the device, it is important to give no indication of possible or expected responses either before or during the administration. The device should be self-administered and should require no additional explanation by those administering it. Any questions raised should be answered with vague generalities (examples: "anything you want to put down," "whatever you think," "yes, that is fine," or "yes, that's the sort of thing").

The quality of responses is likely to vary inversely with the amount of time allowed for the administration of this device. A number of factors, such as interest, fatigue, etc., contribute to this phenomenon. It is recommended that a maximum time limit of fifteen minutes per question be set. When indirect administrations are employed, a time limit might be suggested on the query sheet, even though it is impossible to enforce compliance uniformly. When administered in conference settings, respondents who complete their answers in less than the allotted time should be free to leave if they so desire.

It is desirable, for control purposes, to secure both the respondent's organizational position and signature on the OEQ device. Respondents should be assured that no superordinate or subordinate personnel in the organization will have access to their responses.

Analysis and Classification of Responses

Information gathered from the OEQ device alone would provide a sound base for both qualitative and quantitative analysis of the researched organization. At least three different analytical forms could be employed: an analysis of literal content (an analysis of a level of meaningfulness to the respondents themselves); a more abstract analysis of referential frames; and, perhaps the most abstract, the logical form into which statements made by the respondents arranged themselves.

However, the technique does not attempt to use the information obtained by this device in any direct analytical form. Rather, the OEQ device is used

for the sole purpose of generating and selecting significant elements or descriptive statements about the organization. These statements are then numbered and classified as to their literal content by using *subject* as one criterion and *action verb* as a second classification criterion.

Once the range of subjects and the degree of action imputed to these subjects have been classified, a representative sample of the entire range of classified responses is formed into a Rating Scale device. This final device now contains, initially, the *elements* of the organization to be analyzed. These elements are now in the form of literal and highly specific descriptive statements about the organization.

The Rating Scale Device

The interpretation of the results obtained from the Rating Scale device will be based on the notion of consensus or variation of the elements as perceived by members of the organization under analysis. Here I, as did Gross, et al. (1958) treat consensus as a *variable* rather than as an attribute. In this framework, the complete presence and complete absence of consensus are limiting cases. The first rarely, if ever, occurs in social action; the second occurs frequently, but not inevitably.

Considering consensus on role definition to be a variable brings up the following questions: How much and on what aspects is consensus essential to the effective functioning of an organization? Are there optimum degrees of consensus? Are extreme degrees of consensus dysfunctional? How little consensus can there be without the disintegration of the organization?

To investigate consensus problems empirically, it is necessary first to specify the organization, its objects, and the member populations to be analyzed; and second, to obtain data on the expectations held for and by members concerning specific variables (Gross, 1958:101).

A methodology based on "consensus" must specify clearly "consensus on what" and "consensus among whom" (Gross, 1958:96). In the methodology developed for this paper, the degree of consensus measured refers to the elements or descriptive statements about the organization as perceived by its members. These elements were derived from the three intervening variable postulates specified by Sower's theory. The specific formulation of the element was accomplished through the use of the OEQ device. The Rating Scale device asks each member to what extent he or she agrees with the elements (specific descriptive statements) as stated. The respondent chooses one of the following response categories for each element: (1) strongly agree, (2) agree, (3) may or may not agree, (4) disagree, or (5) strongly disagree. Sample questions derived from

Postulate I, which were used in the Livestock Health Council Study, are presented below.

1. The purpose of the Michigan Livestock Health Council should be to:
 Rating Scale (1=Strongly Agree; 5=Strongly Disagree)
- 1 2 3 4 5 1. Provide the means for various interest groups to communicate and work together in solving or trying to solve livestock and poultry disease problems.
- 1 2 3 4 5 2. Continually review and evaluate the livestock and poultry health situation in Michigan.
- 1 2 3 4 5 3. Develop and coordinate cooperative programs of disease eradication in livestock and poultry between producers, processors, consumers, and other interest groups.
- 1 2 3 4 5 4. Promote initially and back those laws regulating programs which are essential and practical to safeguard the health of Michigan's livestock and poultry.

Given a series of distributions, each of which is comprised of the responses to a single expectation item containing the five response categories, the problem is obtaining scores that will rank the items on a continuum of consensus. Gross, et al. (1958:109) point out that if all responses for an item fall in one category, clearly there is perfect consensus. However, not all will approach or even come near this extreme. Consequently, at least the two factors of central tendencies and variability of the distribution need to be considered in consensus measurements. These statistics should account for both the height and the range of scored distributions obtained.

Results of earlier research appear to bear out this supposition. Gross, et al. (1958:108) found that mean and variance satisfactorily reflect degree measurements of consensus; measures of central tendency such as mean, mode, or median, in calling attention to direction of the measurements taken, give similar results. The use of variance scores of the distribution was found to offer the advantage over other distribution statistics of calling attention to disagreements on intensity rather than on direction. That is, the responses given could be all positive or all negative and still present meaningful differences.

The use of variance as a statistic lends itself easily to a variety of statistical computations and manipulations. For example, the difference in the degree of consensus on a given element for the various subgroups of the selected organization can be quickly determined by the *F* test, variance ratio, chi-square, or other easily applied statistical tests.

The interpretation of the findings obtained from the Rating Scale device is therefore based on the variance of the grand mean score or mean score of all respondents as the defined *measure of consensus*.

A small variance is defined as consensus; a large variance is defined as no consensus. It is arbitrarily held that any variation about the grand mean score equal to or greater than one standard deviation from the mean variation, or any variance equal to or greater than 1 at the probable α .95 level of significance, is, by definition, a significant difference in variation and, therefore, does not meet the test for consensus.

In this procedure, the statistical test used to determine the difference in variance at any specified level of significance is the One-Sided Test of Hypothesis concerning a Single Variance (Nixon & Massey, 1957:104–106). The hypothesis tested is $\alpha^2 \leq \sigma_0^2$. If the level of significance selected is α .95, the statistic is $X^2/df = (s^2/\sigma_0^2)$.

Summary

Analytical instruments applicable for use in the analysis of complex organizations must be tight, reliable, and efficient tools that are economical and easy to use. At the same time, these instruments should be flexible enough to allow respondents to express themselves freely and concisely. Among other things, the technique and instruments described, when fitted with an appropriate theory, feature:

1. Open-ness—that is, this technique approaches the specific organization in its initial contact with a relatively unstructured Open-Ended Question device. The purpose of the device is to permit respondents (members of the organization) to identify and select elements of their organization that they perceive as important to that organization. The OEQ device thus represents an alternative solution to the basic problem of choice faced by the organizational analyst when attempting to determine what and whose view about what and whose goals to include in the research.
2. Closed-ness—that is, with its follow-up device, the Rating Scale, this technique ultimately forces respondents to provide scaled measurements of consensus variations about specific elements that comprise the intervening test variables. Note that the scaled responses are generated from the organization's members.
3. Self-ness—that is, the analysis is conducted from within the organization itself as reflected through the perceptions of its members. It is an analysis of the organization "self."
4. Efficiency—that is, the technique and its instrumentation are designed to minimize time, physical resources, and costs of obtaining an optimum amount of descriptive explanatory and predictive information about a specific organization. By using this technique and its instrumentation,

it is possible for an outside researcher or consultant to enter a complex organization and, within a matter of a few days' time, objectively describe and make predictive probability statements concerning that organization's patterns of intraorganizational action.

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