

Typologies as a Unique Form of Theory Building: Toward Improved Understanding and Modeling

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# TYOLOGIES AS A UNIQUE FORM OF THEORY BUILDING: TOWARD IMPROVED UNDERSTANDING AND MODELING

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Organizational typologies have proved to be a popular approach for thinking about organizational structures and strategies. Authors developing typologies, however, have been criticized for developing simplistic classification systems instead of theories. Contrary to these criticisms, we argue that typologies meet the criteria of a theory. When typologies are properly developed and fully specified, they are complex theories that can be subjected to rigorous empirical testing using the quantitative models we develop. We conclude by discussing the advantages of typological theories and presenting guidelines to improve the development of typologies.

Typologies are a very popular, but often misunderstood form of theory. Journals and even undergraduate textbooks make frequent references to popular typologies such as Miles and Snow's (1978), Mintzberg's (1979, 1983), Porter's (1980, 1985), Weber's (1946), and so on. These and other existing typologies have stimulated a tremendous volume of empirical research and captured the imagination of many scholars, managers, and students.

One plausible reason for the popularity of typologies is that they appear to provide a parsimonious framework for describing complex organizational forms and for explaining outcomes such as organizational effectiveness or groupthink. Typologists usually achieve parsimony by providing elegant descriptions of their typologies and glossing over the complex processes that determine the focal organizational outcomes. The cost associated with this parsimony is that most typological theories are inadequately developed because the causal processes operating within each type of organization are not fully specified (Scott, 1981). Generally,

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these complex processes are summarized simply as the internal consistency or "fit" among the important contextual, structural, or strategic factors. This overemphasis on describing the *typology* and underemphasis on developing the underlying *theory* have opened the typological literature to criticism.

The most severe criticism is that typologies traditionally have been viewed as classification systems rather than as theories. For example, Rich argued that typologies are classification schemes and, as such, provide "a means for ordering and comparing organizations and clustering them into categorical types" (1992: 758). McKelvey (1982) defined typologies as essentialism, which is a theory of classification. Bacharach conceded that typologies are more abstract than simple categorical devices, but argued that typologies are a mode of description that must be distinguished from theory and concluded that "typologies are limited to addressing the primary question asked by descriptive researchers" (1989: 497). In sum, typologies are believed to be far short of being theories.

Given such criticism, a researcher might reasonably conclude that organizational typologies are atheoretical devices that are mainly useful for categorization. We argue, however, that such a conclusion would be incorrect; typologies are complex theories that are frequently misinterpreted. Although some of these criticisms apply to existing "typologies," these criticisms do not generalize to the typological approach to theory building. Instead, the problems with many existing typologies are the result of a misunderstanding about what typologies are (or should be), improper development of the typology, and a failure to take full advantage of the unique form of theory building represented by the typology approach.

The main thesis of our article is that typologies are complex theoretical statements that should be subjected to quantitative modeling and rigorous empirical testing. Typologies are differentiated from classification systems, shown to meet several important criteria of theories, and shown to contain multiple levels of theory. We develop a general approach for modeling typological theories and present techniques for tailoring the general approach to the complicating assumptions incorporated in many typologies. We conclude by discussing the advantages of typological theories and presenting a set of guidelines to improve the development of typologies.

## TYPOLOGIES AS COMPLEX THEORIES

Many theorists argue convincingly that typologies are not theories (e.g., Bacharach, 1989; Blalock, 1969; Scott, 1981). At best, critics might interpret a typology as a set of organizational types. At worst, a typology might be viewed as a sloppy categorical classification system. A theory, by contrast, is a series of logical arguments that specifies a set of relationships among concepts, constructs, or variables (Bacharach, 1989;

Blalock, 1969; Dubin, 1969; Whetten, 1989). Given this definition of a theory and the common interpretation of a typology, it is understandable that many theory-building experts argue that typologies are not theories.

We argue, however, that this negative interpretation of typologies is incorrect on three counts. First, typologies are distinct from classification systems. Second, typologies meet at least three important criteria of being a theory. Third, typological theories are more complex than traditional bivariate or interaction theories because they incorporate multiple levels of theory. The next three subsections defend each of these assertions.

### Typology Versus Classification

The terms *classification scheme*, *taxonomy*, and *typology* have been used interchangeably in much of the relevant literature (e.g., Carper & Snizek, 1980; Hall, 1991; Hambrick, 1983a; Scott, 1981). This "semantic confusion" (McKelvey, 1975: 509) has helped to conceal important differences among these tools. To reduce the current state of confusion, we provide the following clarifications. The first two terms, *classification scheme* and *taxonomy*, refer to classification systems that categorize phenomena into mutually exclusive and exhaustive sets with a series of discrete decision rules. For example, Woodward's (1965) classification scheme allows organizations to be assigned to mutually exclusive sets based on the level of technological complexity. McKelvey's (1982) taxonomy differentiates organizations into mutually exclusive sets using a series of hierarchically nested decision rules. The third term, *typology*, refers to conceptually derived interrelated sets of ideal types. Unlike classification systems, typologies do not provide decision rules for classifying organizations. Instead, typologies identify multiple ideal types, each of which represents a unique combination of the organizational attributes that are believed to determine the relevant outcome(s). For example, Mintzberg (1979, 1983) identified five types of organizational structures that are hypothesized to result in maximal organizational effectiveness, and Porter (1980, 1985) identified three ideal-type strategies that are hypothesized to maximize competitive advantage.

The definition we provide for typologies is more restrictive than the definition suggested by common usage of the term. This restriction is necessary to increase the precision of our nomenclature and to reduce the semantic confusion that currently characterizes the literature. Further, this definition highlights the primary difference between classification systems and typologies. Classification systems are intended to provide a set of decision rules for categorically assigning organizations to heterogeneous groups that, in combination, constitute a mutually exclusive and exhaustive set of organizational forms (McKelvey, 1982). Typologies are intended to predict the variance in a specified dependent variable because the organizational types identified in typologies are developed with respect to a specified organizational outcome.

One consequence of distinguishing typologies from classification systems is that many existing "typologies" are not typologies; they are classification systems. For example, Woodward's (1965) "typology" is a classification system rather than a typology. Woodward's ideas allow organizations to be classified into one of three ordinal categories but do not identify a unique and distinct set of ideal type organizations. Similarly, Perrow's (1967) "typology" is really a classification system for organizational technologies that identifies four mutually exclusive technologies: craft technologies, routine technologies, non-routine technologies, and engineering technologies.

### Criteria of Being a Theory

The previous discussion differentiates typologies from classification systems but does not demonstrate that typologies are theories. If typologies are theories, they must meet some minimal definition of a theory. Although there are no concise, unanimously accepted definitions of a theory, theory-building experts seem to agree that there are at least three primary criteria that theories must meet: (a) constructs must be identified, (b) relationships among these constructs must be specified, and (c) these relationships must be falsifiable (cf. Bacharach, 1989; Blalock, 1969; Dubin, 1969; Kerlinger, 1986; Whetten, 1989).

**Constructs in typologies.** Typologies contain two distinct kinds of constructs. The first is the ideal type (McKinney, 1966; Weber, 1904). Ideal types are complex constructs that can be used to represent holistic configurations of multiple unidimensional constructs. They are intended to "provide an abstract model, so that deviation from the extreme or ideal type can be noted and explained" (Blalock, 1969: 32). The ideal types are formed as "the one-sided accentuation of one or more points of view and by the synthesis of a great many diverse, more or less present and occasionally absent concrete individual phenomena" (Weber, 1904: 90). An ideal type is not "a 'hypothesis' but it offers guidance to the construction of hypotheses" (Weber, 1904: 90). These ideal types are theoretical abstractions thought to result in a specified level of a dependent variable. For example, Miles and Snow (1978) describe the prospector, analyzer, and defender as ideal types of organizations that are maximally effective.

The inclusion of ideal types has at least three important implications for typological theories. First, the ideal types represent organizational forms that *might exist* rather than existing organizations. Thus, empirical examples of ideal-type organizations are expected to be very rare or non-existent. Second, the ideal types are complex phenomena that must be described in terms of multiple dimensions. Third, ideal types are not categories of organizations. Instead, each ideal-type organization represents a unique combination of the dimensions used to describe the set of ideal types. Actual organizations *may be more or less similar to an ideal type, but they should not be assigned to one of the ideal types in the typology.*

Typologies also include the unidimensional constructs that are the building blocks of traditional theoretical statements. These "first order" constructs are the dimensions used to describe each ideal type in the theory. For example, Mintzberg (1979, 1983) described his five ideal types using first-order contextual constructs such as age, size, environmental uncertainty, and so forth, and first-order structural constructs such as formalization, specialization, centralization, and so on.

**Relationships among constructs.** A second criterion is that a theory must hypothesize relationships among the constructs incorporated in the theory (Bacharach, 1989; Blalock, 1969; Dubin, 1969; Kerlinger, 1986; Whetten, 1989). Unlike more traditional theories, typological theories do not highlight the hypothesized relationships between the unidimensional first-order constructs and the dependent variable(s). Instead, typological theories highlight the internal consistency among the first-order constructs within an ideal type, and they explain why this internally consistent pattern results in the specified level of the dependent variable(s). Thus, typologies hypothesize relationships between the similarity of an actual organization to an ideal type and the dependent variable(s). For example, in many typological theories (e.g., Miles & Snow, 1978; Mintzberg, 1979, 1983) greater similarity to an ideal type is posited to result in greater effectiveness because the relevant contextual, structural, or strategic factors are thought to be consistent within each ideal type. Both Miles and Snow (1978) and Mintzberg (1979, 1983) hypothesized that organizations that resemble more closely any one of their ideal types are predicted to be more effective, whereas organizations that less closely resemble their ideal types are predicted to be less effective. Other typologies have been developed to explain outcomes such as competitive advantage (Porter, 1980, 1985), groupthink (Janis, 1972), charismatic leadership (Trice & Beyer, 1993; Weber, 1947), transformational leadership (Tichy & Devanna, 1986), total quality management (Juran, 1989), and innovation (Kanter, 1983).

**Falsifiability.** The final criterion for considering typologies as theories, falsifiability, implies that the predictions associated with a typology must be testable and subject to disconfirmation (Cook & Campbell, 1979; Lave & March, 1975; Popper, 1959). The predictions that must be testable to classify typologies as theories are the hypothesized relationships between similarity to the ideal types of organizations and the dependent variable. These predictions can be falsified by measuring the deviation between real organizations and an ideal type and then using this deviation to predict the dependent variable.

### **A Typology as Multiple Theories**

Although typologies usually have not been interpreted as theories, good typologies provide two different levels of theory, a grand theory that generalizes to all organizations and middle-range theories that are restricted to the individual types. The grand theories are often not

recognized for at least two reasons. First, the grand theoretical assertions incorporated in typologies are often implicitly, rather than explicitly, stated. For example, Miles and Snow (1978) argued that at least three of their ideal types are effective but did not explicitly state *why* the set of ideal types should predict effectiveness across the population of organizations. Further, they present equivocal arguments about the predicted effectiveness of their fourth type, the reactor. The implicit grand theoretical statement in Miles and Snow's typology is that the set of organizational types identify the configurations of contextual, structural, and strategic factors that maximize fit, which results in effectiveness. This implicit theoretical assertion is common to many typologies that identify a set of effective organizational types (e.g., Miles & Snow, 1978; Mintzberg, 1979; Weber, 1946). Second, typologies are not grand theories about the organizational types, but rather are grand theories explaining the dependent variable. For example, Miles and Snow (1978) did not develop a grand theory of strategy, structure, and process, but rather they developed a grand theory of organizational effectiveness. Similarly, Mintzberg titled his 1979 book, *The Structuring of Organizations*, but developed a grand theory focused on predicting organizational effectiveness rather than a grand theory of organizational structure. Neither grand theory explains the strategies or structures adopted by organizations; rather, they explain organizational effectiveness as a consequence of the similarity of the organizations to the ideal types.

Fully developed typologies also contain a set of middle-range theories that have narrower boundaries than the grand theory (Pinder & Moore, 1979; Weick, 1974). These middle-range theories are formed by the set of causal arguments explaining the internal consistency of the underlying processes within each ideal type. The pattern of relationships among the first-order constructs that results in internal consistency is not expected to generalize to all of the ideal types or to all organizations. Thus, the relationships between constructs within an ideal type and the dependent variable may vary across the set of types. For example, Miles and Snow (1978) argued that product innovations will result in higher effectiveness in organizations pursuing a prospector strategy because innovations are consistent with the strategy and structure of the prospector. However, product innovations will result in lower effectiveness in organizations pursuing a defender strategy because innovations are inconsistent with the strategy and structure of the defender.

The previous arguments have demonstrated that typologies meet the criteria of being a theory. However, typologies cannot be represented in the standard linear frameworks that are used to build and test traditional forms of theories because they are a unique form of theory based on a set of ideal types. In order for researchers to build strong, internally consistent typological theories it is critical that they understand the underlying models for this form of theory. As was noted, typological theorists leave critical assumptions and hypotheses that are unique to the typological

form of theory building unstated. Thus, we develop a general approach for modeling typological theories that captures the holistic nature of configurational assertions in typologies.

### MODELING TYPOLOGICAL THEORIES

To empirically falsify any theory, the verbal model presented by the initial theorist must be translated into a quantitative model. Any statistical test is based on one or more equations that model key assertions of the theory. This quantitative model must be an accurate translation of the verbal theory, or the empirical test will not be valid (Blalock, 1969; Venkatraman, 1989).

To accurately model typological theories, the quantitative models must capture the similarity of real organizations to one or more of the ideal types because similarity to the ideal types is hypothesized to predict the dependent variable. The similarity of real organizations to ideal types of organizations can be modeled as profile similarity (Doty, 1990; Van de Ven & Drazin, 1985; Venkatraman, 1989). Techniques for assessing profile similarity are well developed (Cattell, 1949; Cronbach & Gleser, 1953; Miller, 1978; Overall, 1964). Most of these techniques assess deviation with some form of the weighted Euclidean distance formula presented in Equation 1.0.

$$D_{io} = \sqrt{(X_i - X_o)' W (X_i - X_o)} \quad (1.0)$$

where:

- $D_{io}$  = the distance between ideal type  $i$  and organization  $o$
- $X_i$  = a  $1 \times j$  vector that represents the value of ideal type  $i$  on attribute  $j$
- $X_o$  = a  $1 \times j$  vector that represents the value of organization  $o$  on attribute  $j$
- $W$  =  $j \times j$  diagonal weighting matrix that presents the theoretical importance of attribute  $j$  to ideal type  $i$ .

The additive inverse of this deviation measure constitutes a fit index. The typological theory can then be tested by using the fit index to predict the dependent variable. For example, the simplest interpretation of Miles and Snow's (1978) theory is that an organization will be more effective to the extent that it more closely resembles any one of the ideal types identified in their theory (Doty, Glick, & Huber, 1993). This interpretation of the theory can be tested by using the minimum deviations (i.e., the maximum fit) between real organizations and each of the ideal types to predict organizational effectiveness.

The deviation approach just outlined provides a general analytical approach for modeling typological theories. Developing a valid model of a specific typological theory, however, is complicated by three factors: (a) the ideal types unique to each theory must be modeled, (b) the relative



theoretical importance of the first-order constructs used to describe the ideal types must be included in the model, and (c) any assumptions about contingency factors and hybrid types must be modeled.

### **Modeling Ideal Types**

Precise definitions of the ideal types described in a typology are a prerequisite for modeling the ideal types. Unfortunately, providing such precise definitions is perhaps the most frequently ignored process in typology development. Theorists typically focus on providing rich descriptions of the ideal types. For example, both Mintzberg (1979) and Miles and Snow (1978) devoted chapters in their books to describing each of the ideal types incorporated in their theories. Although these rich descriptions may provide the reader with a "feeling" for the ideal types, they do not provide the unambiguous definitions of the ideal types that are a prerequisite of rigorous theory development and modeling. Thus, the researcher often must refine the typology by developing precise definitions of the ideal types before the theory can be tested.

**Methods of specifying ideal types.** Ideal types are defined by specifying multivariate profiles that represent the ideal types of organizations identified in the theory. These "ideal profiles" are multivariate models of the ideal types that provide the translation between the verbal descriptions of the ideal types in the theory and the operational measures used to assess real organizations on the first-order constructs. Ideal profiles can be specified either theoretically or empirically.

The method of specifying ideal types that is most consistent with the logical structure of typological theories is theoretical specification. Theoretical specification requires expert raters (or the original theorists) to develop the ideal profiles that represent the ideal types of organizations (Doty et al., 1993; Segev, 1989). These raters base their judgment strictly on their interpretation of the theory. The expert raters determine the value of each relevant first-order, unidimensional construct that best describes each ideal type of organization. The mean of the values assigned by the expert raters to each construct for each ideal type constitutes the ideal profile for the corresponding ideal type.

An alternative theoretical approach is possible when two of the ideal types define the endpoints of a continuum. In this special case, one ideal type is scored as the maximum value on each relevant construct and a second ideal type is scored as the minimum value on each construct. These two ideal types define the endpoints of the continuum. Other ideal types are positioned relative to the endpoints of the continuum. For example, if one ideal type of organization is described as the midpoint of the continuum, then the profile for this ideal type is specified as the exact midpoint on each of the relevant constructs. Though this approach has been used successfully (Govindarajan, 1988), it is of limited value because many typologies identify ideal types that do not define a continuum (see, for example, Mintzberg, 1979, 1983). Further, some theories that define a

single continuum do not position any of the ideal types at the endpoints. For example, extreme levels of formalization and standardization are likely to be counterproductive in very mechanistic organizations (Burns & Stalker, 1961). Thus, the ideal profile for the mechanistic organization should not be specified with extremely high levels of formalization and standardization.

Ideal types also can be modeled using empirically specified ideal profiles. In this method of specification, organizations in the sample that resemble most closely the ideal types of organizations described in the theory are independently identified by the researcher. These organizations may be identified via a qualitative assessment made by a researcher who is very familiar with all of the organizations in the sample. The value of the selected organizations on each first-order construct can be used to specify the appropriate ideal profile. Alternatively, key informants in the organizations can indicate the extent to which their organization resembles each ideal type. The best examples of each ideal type can then be determined by examining the ratio of the extent to which one ideal-type description characterizes the organization divided by the sum of the extent to which each of the other ideal-type descriptions characterize the organization (Doty, 1990). The organizations with the highest value for each ideal type can then be used to specify the ideal profile for the respective ideal type.

**Comparing theoretical and empirical specification.** Both the theoretical and the empirical methods of specifying ideal profiles are appropriate for testing typologies because both of these approaches specify ideal profiles without reference to the dependent variable. Thus, the key in typological theories, that similarity to the ideal types determines the dependent variable, can be falsified. Both the theoretical and empirical methods also yield explicit profiles of each ideal type on the first-order, unidimensional constructs. Thus, these profiles can be examined, critiqued, and replicated by independent researchers. Despite these similarities, the theoretical approach has a number of advantages over the empirical approach for the purposes of falsification.

The primary advantage of theoretical specification is that the theory-development process is not constrained by the sample because the ideal profiles are not specified with organizations in the sample. The empirical approach, by contrast, defines the theory with the data because the ideal types, which serve as theoretical models in the theory, are specified with organizations that exist in the empirical sample. Consequently, the empirical approach fits the ideal types, and thus the theory, to the data.

Theoretical specification of the ideal types also should result in greater correspondence between the ideal profiles and the ideal types of organizations described in the theory. Theoretical specification allows accurate ideal profiles to be specified for each ideal type even if real organizations that closely resemble the ideal types are not included in the sample. Empirically specified ideal profiles might provide a good approx-

imation of the ideal types because the organizations most similar to the ideal types are used to develop the ideal profiles. However, the correspondence between the empirically specified ideal profiles and the ideal types described in the theory is restricted by the sample of organizations. The organizations in the sample may or may not correspond closely to the ideal types described in the theory. Thus, the probability that the theoretically specified ideal profiles will provide accurate representations of the ideal types is higher than the probability that the empirically specified ideal profiles will provide accurate representations of the ideal types.

A third advantage of the theoretical method of specification is that the range of the dependent variable is not restricted by the sample. For example, the theoretically specified ideal profiles might predict a level of effectiveness that has not been attained by any organizations in the sample. The empirical method of specification, in contrast, restricts the range of organizational effectiveness to the maximum level of effectiveness that is exhibited in the sample. It is unlikely that any organization in the sample has reached the maximum level of effectiveness that is theoretically possible. Further, the most effective organizations in the sample will not necessarily be used to specify the ideal types because the most effective organizations may not resemble the ideal types identified in the theory. Restricting the range of effectiveness (i.e., the dependent variable) may reduce the resulting predictive power of the test of the theory and also may threaten the validity of tests of the theory. Thus, theoretical specification of the ideal profiles should result in more valid tests of configurational theories.

One potential risk with theoretical specification is that the ideal profiles may not correspond to the ideal types described in the theory. This problem can occur if the theory is too vague to allow the raters to assess each ideal type on each first-order construct, or when the raters misinterpret the theory. If the ideal profiles do not correspond to the descriptions of the ideal types of organizations in the theory, then the test of the theory may not be valid. A partial guard against this risk is the publication of ideal profiles for verification by independent researchers. Overall, however, the advantages of theoretical specification for hypothesis testing appear to outweigh this potential risk.

### **Theoretical Importance of Each First-Order Construct**

The second complication to modeling a specific typological theory is modeling the relative theoretical importance of each first-order construct used to describe the ideal types. The theoretical importance of each construct is modeled in the weighting matrix,  $W$ , incorporated in the deviation analysis (see Equation 1.0). At least three alternative assumptions about the theoretical importance of the constructs seem reasonable. They are presented in order of increasing complexity.

One plausible assumption is that each of the first-order constructs

included in the theory is equally important. For example, Doty and colleagues (1993) assumed that each of the first-order constructs used to describe Miles and Snow's (1978) ideal types such as product/market development, environmental complexity, and formalization were equally important. This assumption implies that the weighting matrix should be specified as an identity matrix. The assumption of equal importance among first-order constructs also has been explicitly adopted by Segev (1989) and implicitly adopted by other researchers who assess deviation with the unweighted Euclidean distance formula (Drazin & Van de Ven, 1985; Govindarajan, 1988; Pennings, 1987).

A second plausible assumption is that the second-order factors such as context, structure, and strategy may assume equal theoretical importance, whereas the theoretical importance of first-order constructs such as environmental turbulence, formalization, and product scope is not equal. For example, Mintzberg's (1979, 1983) theory can be interpreted such that the second-order factors, context and structure, are equally important but first-order constructs, such as age, size, formalization, and centralization, assume differential theoretical importance (Doty et al., 1993). This assumption implies that the weighting matrix should be defined as a diagonal matrix with the element that corresponds to each construct equal to the inverse of the number of constructs incorporated in the corresponding second-order factor.

A third plausible assumption is that neither the different second-order factors nor the first-order constructs are of equal theoretical importance (Venkatraman & Prescott, 1990). Researchers adopting this assumption may allow the theoretical importance of the first-order constructs or the second-order factors to vary across the set of ideal types. When this third assumption is used, the weighting matrix should be specified to reflect the a priori theoretical importance assigned to the first-order constructs or to the second-order factors.

The arguments here are not intended to suggest that one specification of the weighting matrix is superior to another. Different weighting assumptions are appropriate for different theories. However, the researcher should acknowledge explicitly the assumptions about the theoretical importance of first-order constructs or second-order factors that are embedded in the typology and specify the weighting matrix accordingly.

### **Unique Assumptions about the Set of Ideal Types**

A third complication to modeling specific typological theories arises because different theorists incorporate different assumptions about the set of ideal types in the typology. Generally, these assumptions involve contingency factors that somehow restrict an organization's choice among the types or the existence of hybrid types (i.e., combinations of the initial ideal types).

**Contingent types.** Theorists posit contingent ideal types when they identify contingency factors that determine the one ideal type of

organization that a real organization must resemble to remain maximally effective. When important contingency factors are not identified in the theory, the organization may adopt any of the ideal types defined by the theory and be maximally effective. When important contingency factors are identified, however, the form that an organization must adopt to remain maximally effective may be restricted to a single ideal type. For example, Mintzberg (1979, 1983) argued that contextual contingencies may limit a given organization to a single effective organizational type.

When contingency factors restrict an organization's choice among the ideal types, the appropriate ideal type for use in the deviation analysis must be identified. The appropriate contingent ideal type can be identified by conducting a deviation analysis that is restricted to the measures used to describe the contingent factors. For example, if the ideal type of organization is contingent on the organization's context, the initial deviation analyses would be conducted by specifying Equation 1.0 with contextual factors. The appropriate ideal type for the organization is then defined as the ideal type with a context most similar to the organization's context. After the appropriate contingent ideal type is identified, a second deviation analysis is conducted in which all organizational constructs are included. This second deviation analysis determines the similarity between the real organization and the contingent ideal type.

**Hybrid types of organizations.** A second complicating assumption that is often incorporated in typologies is that hybrid types may exist. All configurational theories initially identify a finite number of ideal types. For example, Miles and Snow (1978) identified four ideal types, and Mintzberg (1979, 1983) identified five ideal types. Many typological theories, however, allow for hybridization among the organizational types. Hybrid types are combinations of the initial ideal types that are also posited to result in the relevant organizational outcome. Typically, hybrid types are posited to be effective when organizations must respond simultaneously to conflicting contingencies (Gresov, 1989; Mintzberg, 1979).

Hybridization among the initial ideal types can result either in a finite or an infinite set of hybrid types. When a finite number of hybrid types are specified, these hybrid types are conceptually and analytically equivalent to the initial ideal types identified in the theory. Thus, when a theorist explicitly identifies a finite number of hybrid types, these hybrid types can be modeled using either of the specification techniques discussed previously in this article.

When an infinite number of hybrid types is allowed, the process of modeling the hybrid forms is more complex. The theorist developing the typology should differentiate effective hybrid types from ineffective hybrid types by explicitly defining the permissible pattern of hybridization. Unfortunately, theorists rarely, if ever, specify the pattern of permissible hybridization. If the pattern of hybridization is not explicitly defined in the theory, then one must assume that complete hybridization among the original ideal types is permissible, and that all of these hybrid types will

result in the specified level of the dependent variable. In this case, the researcher testing the theory must first specify the hybrid type(s) of organization that is consistent with the theory and that most closely resembles a given organization before conducting the deviation analysis. For each organization, the most similar hybrid organization can be specified using Equations 2.0 and 2.1.

$$\beta_o = (X_o X_o') (X X')^{-1} \quad (2.0)$$

where:

- $\beta_o$  =  $\alpha$   $1 \times i$  vector that represents the extent to which organization  $o$  resembles ideal type  $i$
- $X_o$  =  $\alpha$   $1$  by  $j$  vector that represents the value of real organization  $o$  on attribute  $j$
- $X$  = an  $i \times j$  matrix that represents the value of ideal type  $i$  on attribute  $j$ .

Equation 2.0 combines the information about the organization with information about the set of ideal types to determine the extent to which the real organization resembles each ideal type. The beta matrix that is produced from Equation 2.0 is then used in conjunction with Equation 2.1 to produce the ideal profile for the hybrid organization that is most similar to the existing organization.

$$X_h = \beta_{o1} X_o + \beta_{o2} X_o + \dots + \beta_{oi} X_o \quad (2.1)$$

where:

- $X_h$  =  $\alpha$   $1 \times j$  vector that represents the value of hybrid type  $h$  on attribute  $j$
- $X_o$  =  $\alpha$   $1 \times j$  vector that represents the value of organization  $o$  on attribute  $j$
- $\beta_{oi}$  =  $\alpha$  scalar element (taken from  $\beta_o$ ) that represents the extent to which organization  $o$  resembles ideal type  $i$ .

After the ideal profile for the appropriate hybrid type has been calculated, the similarity of the real organization to the hybrid type can be assessed using Equation 1.0. The resulting deviation measure represents the similarity of the organization to the most similar hybrid type of organization.

### Operationalizing and Testing Typologies

The approach for modeling typologies discussed above has been used successfully to operationalize and test typological theories. For example, Mintzberg's typology (1979, 1983) was operationalized by identifying three plausible interpretations of the arguments he presented predicting that greater similarity between a real organization and one or more ideal types of organizations would result in organizational effectiveness (Doty et al., 1993). One interpretation assumed that organizations would

be more effective to the extent that they resembled any one of Mintzberg's five ideal types. A second interpretation assumed that organizations would be more effective to the extent that they resembled the ideal type with a context most similar to the organization's current context. A third interpretation assumed that hybridization among Mintzberg's five ideal types was permissible, and that an organization would be more effective to the extent that it resembled the hybrid type that was determined by the organization's context. Each of these three interpretations was then operationalized using the modeling approach discussed above and tested with a set of theoretically specified ideal profiles. The results indicated that Mintzberg's (1979, 1983) theory was not supported.

To confirm that the null results were a function of Mintzberg's (1979, 1983) theory rather than the modeling approach, Doty and colleagues (1993) developed a set of similar quantitative models based on Miles and Snow's (1978) typology. When Miles and Snow's typology was operationalized and tested with theoretically specified ideal profiles, it was supported more strongly than with previous categorical treatments of the typological theory. In combination, these two sets of results indicate that the modeling approach discussed in this article can be used to conduct valid tests of typologies.

## CONCLUSIONS

The most important conclusion from our arguments is that, contrary to popular belief, typologies are complex theoretical statements developed to predict variance in dependent variables. Typologies were differentiated from classification systems because typologies identify ideal types of organizations, whereas classification systems specify decision rules to categorize organizations into mutually exclusive and exhaustive sets. Typological theories were shown to meet three important criteria of theories: they have constructs, they predict relationships among the constructs, and these predictions are falsifiable. Further, typological theories may be more complex than traditional theories because they include assertions based on both grand theory and middle-range theory.

Another conclusion from this article is that there is an appropriate approach for testing typologies. Specifically, the deviation from the organizational types should be measured and then used to predict the dependent variable. Other approaches to testing typological theories, such as evaluating their power to classify organizations, are not appropriate because they are inconsistent with the logic of the theories and therefore do not provide accurate or valid translations of the typological theories. Thus, much of the existing literature that purports to "test" typologies should be reinterpreted. Existing typologies should be evaluated empirically with the quantitative models developed in this article before they are rejected or embraced.

A further conclusion is that the typological approach employs a

unique form of theory building that should not be confused with more traditional, linear forms. The advantages of the typological form of theory building, however, have not been fully articulated.

### **Advantages of Typological Theories**

Perhaps the greatest advantage offered by typological theories is that they allow us to move beyond traditional linear or interaction (i.e., contingency) theories. Traditional theories are limited because they specify a consistent relationship between independent and dependent variables. This relationship is not restricted to a monotonic function (Schoonhoven, 1981), but it is hypothesized to be consistent across observed organizations. Typological theories, by contrast, explicitly define multiple patterns of the first-order constructs that determine the dependent variable. Within an ideal type, the configuration of these constructs is hypothesized to have a synergistic rather than an additive effect. Further, the way that the first-order constructs combine to determine the dependent variable can vary considerably across the set of ideal types. For example, two constructs may be positively related in organizations that resemble one ideal type, negatively related in organizations that resemble a second ideal type, and unrelated in organizations that resemble a third or fourth ideal type. Thus, typological theories allow the specification of nonlinear relationships among constructs.

A related advantage of typological theories is that they provide a mechanism for incorporating the holistic principle of enquiry into organizational research. This principle of enquiry suggests that the way that organizational factors *fit* together is very important and that to understand organizations we must consider simultaneously multiple characteristics (McKelvey, 1982; Schwab, 1960; Venkatraman & Prescott, 1990). The ideal-type construct is the mechanism that incorporates the holistic principle of enquiry into typological theories by representing the complex multidimensional *pattern* of organizational attributes. Thus, ideal types integrate multiple attributes of the organization into a holistic definition of fit, rather than focusing on simple additive functions of these attributes. Using ideal-type constructs allows the theorist to represent synergistic effects that result from the consistency among the first-order constructs used to describe each ideal type. These complex synergistic effects incorporated in typologies cannot be represented with only the additive or interactive effects incorporated in more traditional theories.

Typological theories identify multiple ideal types of organizations and thus provide a third advantage not available with more traditional theories: a means for incorporating equifinality in theories. Equifinality is a characteristic of open systems implying that an organization can reach the same end state by following a variety of paths (Katz & Kahn, 1978; Van de Ven & Drazin, 1985). Typological theories can incorporate equifinality because each ideal type identified in the typology will lead an organization to the same desired end state. For example, Miles and Snow (1978)



identified three ideal types of organizations that are hypothesized to result in maximal organizational effectiveness. Any given organization can choose to mimic any one of these ideal types and be effective. Thus, a single organization can maximize effectiveness by pursuing any one of these different strategies.

A fourth advantage offered by typologies is that they allow researchers to move beyond the limitations of the current empirical world. Because typologies are based on ideal types of organizations, they may allow researchers to identify types of organizations that are more effective than any organizations currently observed. For example, typologists may identify ideal types of organizational structures or strategies that do not currently exist, but that, if reached, would improve organizational effectiveness. Further, if these new ideal types are carefully described, practitioners can use the descriptions of these new ideal types as design guidelines for new or existing organizations. Thus, typologies may not only allow theoretical advances, but they may also allow theorists to make better normative prescriptions.

Despite the advantages offered by typological theories, they are subject to at least one serious drawback—they tend to be much more complex than traditional bivariate or interaction theories. This complexity arises primarily from three sources. First, unlike more traditional forms of theory building, typologies are composed of two parts: (a) the description of the ideal types (i.e., the typology) and (b) the set of assertions that relate the ideal types to the dependent variable (i.e., the typological theory). Second, typologies require a large set of constructs to describe the ideal type. As the number of descriptive dimensions is increased, it becomes more difficult to ensure that only those dimensions that are causally related to the dependent variable are included in the typology. Scott (1981) warned that the inclusion of dimensions that are not directly related to the dependent variable (but that spuriously correlate with important constructs) may result in misunderstanding the true causal processes. Third, typologies identify multiple ideal types of organizations and, thus, require multiple middle-range theories to explain a single phenomenon. Each of these middle-range theories specifies a unique set of causal relationships that determines the dependent variable. The inclusion of multiple middle-range theories in a typological theory may increase the accuracy and the generalizability of the theory, but accuracy and generalizability are gained at the cost of simplicity (Weick, 1979). Thus, the intuitive simplicity of typologies masks some important complexities.

### **Guidelines for Developing Typologies**

Regardless of the advantages offered by typologies, these advantages cannot be realized unless typologies are properly developed. Many of the criticisms raised with regard to typologies could be avoided if researchers paid more attention to the proper development of typologies.

We propose the following guidelines that should improve the development of typologies.

1. Typological theorists should make explicit their grand theoretical assertion(s).

The first guideline will help to clarify the intended purpose of typological theories and to reduce the level of confusion currently present in the literature. In many cases, this statement may be rather abstract. For example, in typological theories such as Mintzberg's (1979, 1983) or Miles and Snow's (1978), the grand theoretical assertion is simply that the fit among the relevant constructs leads to organizational effectiveness. An explicit statement of the grand theoretical assertion will facilitate proper testing of typological theories.

2. Typologies must define completely the set of ideal types.

At first, this guideline may seem trivial. Most typological theories appear to identify a discrete set of organizational types. For example, Mintzberg (1979, 1983) initially identified five structural types. The number of types in Mintzberg's theory is complicated, however, because Mintzberg argued that hybrid types, or combinations of the original five structural types, also may be effective. The inclusion of hybrid types in a typological theory threatens the falsifiability of the theory unless all of the additional types are identified. Unfortunately, many current typologies assert that some hybrid types may exist, but fail to specify the forms of hybridization that are allowed in the theory. When theorists allow hybridization among the initial ideal types, they should take one of two steps to ensure that their theory remains falsifiable: (a) they should explicitly define a finite set of hybrid types or (b) they should provide an exact specification of the pattern of hybridization that is consistent with their theory. Specifying all possible hybrid types will increase the likelihood that their typology meets the criterion of falsifiability.

3. Typologies must provide complete descriptions of each ideal type using the same set of dimensions.

Typologists typically provide very rich descriptions of the ideal types identified in their typologies, but often they describe the ideal types with different constructs and with relatively vague and inconsistent terms. This problem may occur because the theorist is describing different causal processes within each ideal type. Constructs that are important to the causal processes in one ideal type may not be important to the causal processes occurring in the other ideal types. However, in order to facilitate the testing of typologies, the typologist should describe each organizational type in terms of all of the constructs included in the theory and provide a concrete estimate of the level on each construct that best represents each ideal type.

4. Typological theories should explicitly state the assumptions about the theoretical importance of each construct used to describe the ideal types.

The theoretical importance of the first-order constructs is a critical factor in calculating the deviation measures necessary to test typological theories. To date, few theorists discuss the theoretical importance of the first-order constructs used to describe the ideal types in their theories. One partial exception to this is the presentation made by Mintzberg (1979, 1983). Mintzberg indicated which constructs are key parameters in his theory, but he did not provide concrete estimates of the relative theoretical importance of each construct. Thus, researchers testing Mintzberg's theory are partly guided to assigning more weight to the key parameters, but are forced to make assumptions about the precise weighting of the first-order constructs that may or may not be consistent with the theory. Future theorists should provide more precise details about which constructs are most important to which ideal types so that researchers testing the theory can develop more accurate models of the theory.

5. Typological theories must be tested with conceptual and analytical models that are consistent with the theory.

The appropriate test of a typological theory is to examine the extent to which deviation from the ideal types predicts the dependent variable specified in the grand theoretical assertion. Researchers should never test typologies by examining the extent to which they can correctly classify organizations because classification is not the purpose of typologies. Further, their tests of typological theories should not categorically assign organizations to one of the ideal types. This guideline implies that many of the existing "tests" of typologies must be viewed with caution. For example, many of the previously reported tests of Miles and Snow's typology have been conducted by categorically defining organizations as one of the ideal types and then comparing the means of the effectiveness among the groups (e.g., Hambrick, 1983b; Smith, Guthrie, & Chen, 1989; Snow & Hrebiniak, 1980) or by comparing the effectiveness of organizations that "change types" (Zajac & Shortell, 1989). Such tests are suspect because they misinterpret Miles and Snow's typological theory as a classification system and, thus, do not develop adequate models of the theory.

A second implication of the above guideline is that tests of typological theories must simultaneously include the entire set of ideal types identified in the typology. When one or more of the ideal types in a theory are not included in the test of the theory, the analytical models used to test the theory will be misspecified. Unfortunately, many tests of typologies do not include the full set of ideal types in the test. For example, Zahra and Pearce (1990) reported that 53 percent of the tests of Miles and Snow's theory they reviewed excluded one of the four ideal types, and 23 percent of the studies excluded two of the four ideal types. Studies that do not include the full set of ideal types identified in the typology result in a

misspecification of the theory and, thus, may not be valid. Further, when the set of ideal types identified in a typology is revised either by identifying new ideal types or by deleting previously identified ideal types, previous tests of the theory will not generalize to the revised theory. For example, Doty and his colleagues (1993) tested the original formulation of Mintzberg's (1979, 1983) theory and concluded that the theory was rejected. However, Mintzberg (1989) presented a revised theory in which two new ideal types have been identified. The findings of Doty and colleagues (1993) may not generalize to Mintzberg's (1989) revised theory because the analytical models used to test the theory were designed to be consistent with Mintzberg's (1979, 1983) original formulation of the theory and, thus, were based on five rather than on seven ideal types.

The set of guidelines offered above cannot assure that future theorists will develop typologies that are useful predictors of outcomes such as effectiveness, groupthink, leadership, or innovation. Adherence to these guidelines, however, will, we hope, increase the probability that new typologies in the organization theory and strategic management literatures will be recognized as theories and tested with analytical approaches that are consistent with the structure of the theory. Typologies are based on a unique form of theory building that is intuitively appealing and holds considerable promise for helping management researchers to understand complex, holistic phenomenon *if* they follow these guidelines.

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